



ANNUAL REPORT

OF THE

INDIAN CENTRAL COTTON COMMITTEE

FOR THE

YEAR ENDING 31st AUGUST, 1940.

Price, Rs. 2.

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CHAPTER I.

1 CONSTITUTION, AIMS AND OBJECTS.

THE Indian Central Cotton Committee was constituted by the Government of India in the Department of Revenue and Agriculture, in their Resolution No 404 22, dated the 31st March, 1921, as a result of the recommendation of the Indian Cotton Committee of 1917 18. Originally, the Committee was purely an advisory body but, with its incorporation under the Indian Cotton Cess Act in 1923, it became an administrative body having at its disposal funds "for the improvement and development of the growing, marketing and manufacture of cotton in India." The funds of the Committee are derived from the cotton cess of two annas per bale (four annas for the first three years) which was imposed in 1923. Having complete control over its funds, the Committee has been able to build up a satisfactory reserve and is at present spending about Rs 10,00,000 per annum on cotton improvement, mainly on agricultural and technological research and seed distribution schemes.

Including, as it does, representatives of growers, agricultural officers, traders, spinners and manufacturers, the Committee has been an invaluable forum for the discussion of many problems of general concern. The ever-increasing understanding which has arisen from the association of leading commercial representatives with growers and research workers has led to developments which, at one time, seemed impossible. Whilst the Committee's constitution ensures a broad outlook on the many problems affecting the cotton industry, its primary concern is the interest and welfare of the cotton grower. In this connection, it should be mentioned that the readiness with which trade associations, particularly the East India Cotton Association, have taken action on recommendations designed to benefit the cotton grower has made the task of the Committee much easier.

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Including, as it does, representatives of growers, agricultural officers, traders, spinners and manufacturers, the Committee has been an invaluable forum for the discussion of many problems of general concern. The ever-increasing understanding which has arisen from the association of leading commercial representatives with growers and research workers has led to developments which, at one time, seemed impossible. Whilst the Committee's constitution ensures a broad outlook on the many problems affecting the cotton industry, its primary concern is the interest and welfare of the cotton grower. In this connection it should be mentioned that the readiness with which trade associations, particularly the East India Cotton Association, have taken action on recommendations designed to benefit the cotton grower has made the task of the Committee much easier.

The activities of the Committee now extend to all branches of cotton improvement in India, whilst as an authoritative body to advise the Central and Provincial Governments on the important matters of cotton policy, it has attained an outstanding position. Funds are provided for research into cotton problems of all-India importance and for the development, extension and marketing of improved varieties of cotton. The aim always is to supplement and not supplant the work of the Agricultural Departments in the cotton growing provinces and Indian States. Though, as a matter of convenience, the Committee has laid down certain lines of demarcation regarding the investigations which it considers appropriate for its grants, the general policy is to give assistance in the directions where it is most needed in the carrying out of a co-ordinated policy of cotton improvement. The Committee realised at the outset that the production of a better variety of cotton will not alone solve the entire cotton problem and that improvement in the science and practice of agriculture must go hand in hand with improvement in the method of disposal of the produce if permanent success is to be achieved. With full appreciation of these and other factors, much attention has been devoted by the Committee to the improvement of primary cotton marketing, to the prevention of adulteration and other abuses, and to many other problems connected with the cotton trade of the country. The success achieved in these directions has indeed been very marked. Legislation for the establishment of regulated cotton markets has been enacted in Bombay and the Central Provinces, while in Madras the establishment of regulated cotton markets is provided for under the Commercial Crops Markets Act. Hyderabad, Indore and some other Indian States have also passed similar legislation, and open markets have been established.

2. PERSONNEL.

A list of the members constituting the Committee and the various interests they represent as on 31st August, 1940, is given in Appendix I. Under the Indian Cotton Cess Rules, members, who are not *ex-officio* members, hold office for three years and one-third of their number retire each year in rotation. The term of office of additional members appointed by the Governor-General in Council under Section 4(xi) of the Indian Cotton Cess Act is three years or such lesser period as may be specified in the notification of appointment.

3. ADMINISTRATION.

Mr. D. N. Mahta continued as Secretary of the Committee throughout the year. Mr. C. J. Bocarro, Assistant Secretary, was on leave for four months,

during which period Mr Ajodhya Sahni Superintendent of the Office created as Assistant Secretary

Dr Nazir Ahmad continued as Director of the Technological Laboratory except for a period of one month when he was on leave and Mr D I officiated as Director

The financial position of the Committee continued to be satisfactory. Receipts during the year amounted to Rs 9,27,770 and the total expenditure to Rs 9,08,106. A statement showing the receipts and expenditure of the Committee and also the Balance Sheet for the year as at 31st March 1940 are given in Appendix II

The following places were visited by the Secretary in connection with the research seed distribution and other schemes of the Committee —
Pooni Surat Indore Nagpur Delhi Baroda and Combatore

4. SUB-COMMITTEES

Most of the detailed work of the Committee is carried on with the help of Sub Committees, appointed annually which hold office from the 1st April. This arrangement not only effects a considerable saving in time in the disposal of business which otherwise would have to remain pending till one of the half yearly meetings of the Central Committee but also lightens the task of that body.

The principal executive body of the Committee is the *Standing Finance Sub Committee* which exercises its powers under Rule 10(2) of the Indian Cotton Cess Rules. It is a statutory Sub Committee consisting of nine members including the President and the Vice President who are *ex officio* members the Vice President being the *ex officio* Chairman. By resolution of the Committee, one of the members of this Sub Committee must be a representative of cotton growers and one an Agricultural Officer. Subject to such restrictions as may be at any time imposed by the Committee, the Finance Sub Committee exercises all the powers of the Committee in regard to the control and disposal of the funds of the Committee and such other powers may be delegated to it. The members of this Sub Committee during the year under review were — Sir Chunilal V Mehta, (Vice President) Chairman, Mr P M Kharegat, (ex officio), Sir Purshotamdas Thakurdas, Mr S. S. Saklatvala, Mr J Vonesch, Mr W J Jenkins, Mr Chandulal P. Naik, Mr Chunilal B Mehta and Sardar Rao Bahadur P.

The functions of the other Sub-Committees and their composition as on the 31st August 1910, are detailed below :—

Local Sub-Committee.—This Sub-Committee is concerned with matters of a general nature, not involving finance, which cannot be postponed for consideration to the usual half-yearly meetings of the full Committee. It is composed of local members and those residing within easy reach of Bombay. The members during the year under review were :—The President (Mr. P. M. Kharegat). The Vice-President (Sir Chunilal V. Mehta). Sir Purshotamdas Thakurdas, Mr. S. D. Saklatvala, Mr. Chunilal B. Mehta, Mr. J. Vonesch, Mr. L. F. H. Goodwin, Mr. Chandulal P. Parikh, Mr. W. J. Jenkins, Mr. A. P. Darlow, Sardar Rao Bahadur Bhimbhai R. Naik and Rao Bahadur Sir Madhaorao Deshpande. Six meetings of this Sub-Committee were held during the year.

Agricultural Research Sub-Committee.—As its name implies, this Sub-Committee is concerned with matters relating to the agricultural schemes financed by the Committee. It reviews the progress reports on and programmes of work of the Committee's research, seed distribution and marketing schemes and makes such observations on them as it considers necessary for their future conduct. It examines proposals for new schemes and extensions of old ones. The progress of the work done by the Committee's research students also comes under its scrutiny. It ordinarily assembles half-yearly, a day or two before the meetings of the Indian Central Cotton Committee.

The constitution of this Sub-Committee was laid down at the 10th meeting of the Indian Central Cotton Committee and additions have been made from time to time ; the members during the year were :—

- I. *The President*—Mr. P. M. Kharegat (*ex-officio*),
- II. *The Vice-President*
- III. *The Co-operative Banking Representative.*
- IV. *Cotton Growers' Representatives.*—Sir William Roberts, Sardar Rao Bahadur Bhimbhai Ranchodji Naik, Mr. Roger Thomas, Rao Bahadur Sir Madhaorao Deshpande,
- V. *Cotton Trade Representatives.*—Sir Purshotamdas Thakurdas, Mr. Chunilal B. Mehta, Mr. Chandulal P. Parikh, Mr. J. Vonesch, Mr. L. F. H. Goodwin, Dr. Chellaram Shewaram,

} Sir Chunilal V. Mehta
(*ex-officio*),

VI *Agricultural Officers*—The Agricultural Commissioner with the Government of India (*ex officio*) Mr H R Stewart Mr W J Jenkins, Mr A R C Westlake Mr R G Allan The Director Institute of Plant Industry Indore (*ex officio*) Rao Saheb K I Thadani, Mr Nizam ud Din Hyder Sardar D K Jadhav Mr Vishnu Sahay, Mr J C McDougall, Mr T G Rama Iyer

VII *Additional Members*—Dewan Bahadur Sir T Vijayaraghavacharya Mr Mohammad Afzal Mr K Ramiah Rai Saheb Kalidas Sawhney Professor R H Dastur Rao Bahadur V Ramanatha Ayyar Dr B L Sethi, Dr R Sankaran Mr S S Pande,

VIII The Secretary

Technological Research Sub-Committee—This Sub Committee deals with matters relating to Technological Research. It was originally constituted at the January 1924 meeting of the Committee with the object of advising the Director of the Technological Laboratory on technical matters. It generally meets during the time of the half yearly meetings of the full Committee. The following were the members of this Sub Committee during the year under report—The President—Mr P M Kharegat (*ex officio*) The Vice President—Sir Chunulal V Mehta (*ex officio*) The Agricultural Commissioner with the Government of India (*ex officio*) Sir Purshotamdas Thakurdas Dewan Bahadur Sir T Vijayaraghavacharya Mr S D Saklatvala Mr Chunilal B Mehta Sir William Roberts Iala Shri Ram Mr H R Stewart Mr W J Jenkins Mr A R C Westlake Mr Chandulal P Parikh Mr L F H Goodwin Capt S R Pocock Mr J Veneji Rao Saheb P V Deshmukh Mr F F G Gilmore Dr Nazir Ahmad Rao Bahadur V Ramanatha Ayyar Rai Saheb Kalidas Sawhney, Mr Y G Deshpande Dr R Sankaran Dr B L Sethi Mr F I Bignell and Mr A D Welwyn (Representing the Bombay Millowners Association) Seth Navnitlal Selarlal and Seth Madan Mohan Mangaldas (Representing the Ahmedabad Millowners Association) Mr R G Srivastava and Mr Jamnadas Ramdas (Representing the East India Cotton Association Ltd) and Mr A B Kotak and Mr R T Mirchandani (Representing the Karachi Cotton Association Ltd). Two meetings of this Sub Committee were held during the year under review.

Wider Markets Sub-Committee—This Sub Committee was constituted by the Committee at its meeting held in August 1933 for investigating the question of finding wider markets for Indian cotton. The members of this Sub Committee during the year were—The President (Mr P M Kharegat) The Vice President (Sir Chunulal V Mehta) Sir Purshotamdas Thakurdas

Dewan Bahadur Sir T. Vijayaraghavacharya, Mr. S. D. Saklatvala, Dr. W. Burns, Dr. T. E. Gregory, Mr. H. R. Stewart, Mr. W. J. Jenkins, Sir William Roberts, Sardar Rao Bahadur Bhimbhai Ranchodji Naik, Mr. Chandulal P. Parikh, Rao Saheb K. I. Thadani, Mr. Nizam-ud Din Hyder, Rao Saheb P. V. Deshmukh, Dr. Nazir Ahmad, Mr. R. G. Saraiya (additional member), Mr. Y. G. Deshpande, Rai Saheb Kalidas Sawhney, Mr. J. C. McDougall, Mr. Vishnu Sahay, Mr. V. Ramdas Pantulu, Mr. J. Vonesch and vacant (four seats).

Standards Sub-Committee.—Constituted in April, 1933, this Sub-Committee is responsible for the preparation for use in India of universal standards of certain growths of cotton dealt with in common both by the East India Cotton Association and the Karachi Cotton Association and of certain other varieties with which only the former Association is concerned. Six meetings were held during the year. The following were the members of this Sub-Committee during the period under review :—Mr. C. P. Bramble (Representing the Imperial Council of Agricultural Research), Mr. Haridas Madhavdas and Mr. Jamnadas Ramdas (Representing the East India Cotton Association), Mr. Hiranand P. Bhatia and Dr. Chellaram Shewaram (Representing the Karachi Cotton Association. Ltd.), Rao Bahadur Sir Madhaorao Deshpande and Mr. M. P. Kolhe (Representatives of Cotton Growers of Oomras Tract), Mr. Y. R. Joshi and Mr. A. J. Kapadia (Representatives of Cotton Growers of Broach Tract), Mr. Mulchand V. Shah and Mr. Bansilal Jivanlal Desai (Representatives of Cotton Growers of Dholleras Tract), Mr. F. B. Lokshmeshwar and Mr. S. B. Betgiri (Representatives of Cotton Growers of Kumpta Tract), Mr. Valilal Chunilal Doshi and Mr. Hiralal H. Pandya (Representatives of Cotton Growers of Mathia Tract).

Cotton Forecast Sub-Committee.—Constituted by the Committee at its meeting held in February 1933, this Sub-Committee is concerned with matters connected with the improvement of the accuracy of cotton forecasts of India. It usually meets half-yearly, a day or two before the meetings of the full Committee. Two meetings of this Sub-Committee were held during the year under report. The composition of the Sub-Committee was as follows :—The President (*ex-officio*), The Vice-President, the Agricultural Commissioner with the Government of India (*ex-officio*), the Director-General of Commercial Intelligence and Statistics, the Director of Agriculture, Bombay Province, the Director of Agriculture, Punjab, the Director of Agriculture, Madras, the Director of Agriculture, United Provinces, the Director of Agriculture, Central Provinces and Berar, the Director of Agriculture, Sind, the Director of Agriculture, H.E.H. the Nizam's Government, the Commissioner of Agriculture,

Baroda the Director of Statistics H F H the Nizam's Government the Director of Land Records Central Provinces and Berar the Deputy Director of Statistics Department of Commercial Intelligence and Statistics the Statistical Officer, Department of Industries and Commerce Madras Dr T E Gregory Mr J Vonesch and Mr L T H Goodwin

Research Students Selection Sub-Committee—This Sub Committee is concerned with the selection of students for scholarships or training grants for research in the several sciences relating to cotton. The members of this Sub Committee during the year under review were—The President—Mr P M Kharegat, The Vice President—Sir Chunilal V Mehta Dewan Bahadur Su T Vijayaraghavacharya Dr W Burns Dr Nazir Ahmad Mr K Ramiah and the Secretary

Cotton Ginning and Pressing Factories Sub-Committee—This Sub Committee is appointed by statute to attend to matters arising out of the Cotton Ginning and Pressing Factories Act 1925. One meeting of this Sub Committee was held during the year under review.

The members of this Sub Committee during the year were —

The Vice President	} Sir Chunilal V Mehta (<i>ex officio</i>)
The Co operative Banking Representative	
Sir Purshotumdas Thakurdas	
Mr S D Saklatvala	
Mr J Vonesch	
Sir William Roberts	
Mr W I Jenkins	
Rao Sahab P V Dushmukh	
Dr Chellaram Shewaram	
Captain S R Pocock	
Vacant (three seats)	

In addition to the above Sub Committees Special Sub Committees are appointed from time to time to deal with specific matters which do not directly fall within the purview of any of the other Sub Committees. Two such Special Sub Committees are—(i) Special Sub Committee on Crop Cutting Experiments on Cotton and (ii) Special Sub Committee on the Institute of Plant Industry Indore were appointed during the year.

The functions of the first Sub Committee were to examine and report on the replies received from the Provinces and States on the proposed co-ordinated scheme of crop cutting experiments on cotton on an all India basis.

The object of this scheme is to obtain, as early as possible, reliable standard yield figures for cotton which would be of material assistance in the preparation of the cotton forecasts. The report of this Special Sub-Committee and the decision of the Committee thereon are dealt with under "Cotton Statistics".

The second Special Sub-Committee, consisting of the Vice-President, Sir Purshotamdas Thakurdas, Dr. W. Burns, Mr. W. J. Jenkins, Mr. P. H. Rama Reddi, Rai Sahab Kalidas Sawhney and the Secretary, was appointed to examine the past and present working of the Institute of Plant Industry, Indore, and to make recommendations for its future organisation. This Sub-Committee met on the 22nd September, 1939, and examined the position with special reference to the following points :—

(1) Whether the Committee was getting adequate return for the money it was spending on the Institute.

(2) Whether fundamental research of the kind carried out at Indore was a necessary part of the work of the Indian Central Cotton Committee and whether, if such research were not done, the work of the Committee would be incomplete or handicapped in any way.

(3) Whether Indore was a suitable place for research on cotton and, if so, whether this work could not be carried out on more economical lines than had been the case in the past.

As regards the first point, the opinion was unanimous that the results obtained had not been commensurate with the amount of money spent by the Committee. On the second point, the opinion of the expert members of the Sub-Committee was that a Central Research Institute for fundamental research on genetics and plant physiology was desirable and that discontinuance of the research on these subjects would render the work of the Committee incomplete to that extent. The Sub-Committee laid emphasis on the fact that plant breeding in India has now reached a stage when fundamental genetical work is necessary to help the plant breeder in determining the characters of the plant, etc. On the last point, *viz.*, whether Indore is a suitable location for research on cotton, the Sub-Committee drew attention to the very good work on genetics done by Mr. Hutchinson at Indore, and expressed the view that it should be possible to produce similar work in the future. The general opinion of the Sub-Committee was that, although Coimbatore was perhaps in some ways a more suitable place, the handicaps imposed by wilt and frost and the inability of Indore to successfully raise

all the types of cotton grown in India, were at present not sufficient reasons to warrant the location of the fundamental research on cotton being shifted elsewhere. The Sub Committee was, however, unanimously of the opinion that this work should be separated from the plant breeding, extension and other work of the Institute and treated as a separate scheme—Cotton Genetics Research Scheme—under the direct control of the Committee. It further recommended that the programme of work should be confined to genetical investigations, methods of sampling, field plot technique, statistical investigations in relation to genetics, etc., that the Geneticist should be directly responsible to the Committee for the working of the scheme which should be financed entirely by the Committee and that the Board of Governors should be requested to place at the disposal of the Geneticist the necessary accommodation and land required for his work. The Sub Committee was unanimously of the opinion that the Committee should limit its grant to the Institute for plant breeding and other work to Rs 30,000, the contribution from the States being estimated at Rs 40,000 per annum. With regard to the representation of the Committee on the Board of Governors, the Sub Committee recommended that this should be on the existing lines, i.e., in proportion to the contribution made by the Committee, the grant for Cotton Genetics Research Scheme not being taken into account for purposes of assessing representation. The Sub Committee suggested further that the usual plant breeding work on cotton and other crops, as well as seed multiplication, distribution and demonstration work and such agronomical and chemical work as might be considered desirable to continue for the benefit of the States, should be controlled by the Board of Governors and financed by the contributions made by the States and the Indian Central Cotton Committee.

The above recommendations of the Special Sub Committee were accepted by the Indian Central Cotton Committee and the new arrangement came into force from 1st April, 1940.

During the period under review, the following members represented the Committee on the Board of Governors of the Institute of Plant Industry, Indore —

The President,
The Vice-President,
Mr W J Jenkins, and
The Secretary

Mr H Sitarama Reddy represented the Committee on the Imperial Council of Agricultural Research. Under Article 51, as amended of the Articles of Association of the East India Cotton Association, the Committee is entitled

to nominate, from amongst the growers' representatives, three persons, whether members of the Association or not, not having dealings in forward contracts, as Directors of the Association. Sardar Bahadur Gurbachan Singh, Mr. H. Sitarama Reddy and Sardar Rao Bahadur Bhimbhai R. Naik were appointed by the Committee for the cotton year 1939-40.

The Committee is an Associate Member of the International Federation of Master Cotton Spinners' and Manufacturers' Associations.

5. PROVINCIAL COTTON COMMITTEES.

The value of Provincial Cotton Committees in dealing with problems of provincial and local importance has been stressed in previous reports; it is evident that such problems can be visualised best by those on the spot, and from this aspect the views of Provincial Cotton Committees are of much value in aiding the Indian Central Cotton Committee to arrive at decisions on the matters submitted for its consideration. The Committee is pleased to note that in those Provinces where Provincial Cotton Committees have been actively functioning, the work done by them has proved to be of material benefit to the Governments concerned.

6. MEETINGS.

Two meetings of the Indian Central Cotton Committee were held during the year under review. The first, at the invitation of the Government of Madras, was held at Coimbatore on the 19th and 20th January 1940. This was the fourth meeting of the Committee to be held outside Bombay, the previous three being held at Indore, Karachi and Lyallpur. The object of holding meetings of the Committee away from its headquarters at Bombay is to afford the members an opportunity of seeing for themselves the work in progress on schemes financed by it. An important resolution passed by the Committee at this meeting at which Mr. D. N. Strathie, Adviser to His Excellency the Governor of Madras, was present, is given below :—

“The Indian Central Cotton Committee observes that in spite of the availability of improved strains of cotton suited for most of the cotton growing tracts in the Madras Presidency, the area yet to be covered by these strains remains very large. This seems to be due to want of adequate funds and suitable organisation to undertake the work of seed distribution. The Committee, therefore, recommends to the Madras Government that steps be taken to provide adequate funds and to make all facilities available to the Agricultural Department and non-official agencies like Rural Co-operative Societies for the production and distribution of large quantities of improved pure strains in order that the whole cotton growing area may be covered by them as quickly as possible.”

The second meeting of the year was held at Bombay on the 8th and 9th August, 1940. This was the usual monsoon meeting at which the progress reports on the various schemes financed by the Committee and programmes of work are examined. Amongst these and other items, the position of Indian cotton, arising as a result of the shutting off of several European markets owing to the war, was discussed at some length at this meeting. Various remedies for meeting the situation were considered, the main suggestion being that an export organisation should be created in conjunction with the various Millowners' Associations for increasing the export of cloth of Indian manufacture outside India, as this was a suitable opportunity for establishing export markets for Indian piecegoods, and for ensuring a permanent increase in the use of Indian cotton in India itself. The desirability, in this connection, of sending a deputation, consisting of experts and representatives of the trade, to overseas markets with the object of finding out precisely the requirements of those markets for piecegoods and raw cotton, *etc.*, was stressed. It was finally agreed that the views of the various Millowners' Associations in India, as well as of the Chambers of Commerce, should be obtained regarding the desirability of setting up an export organisation for the purpose of developing and facilitating the export trade of this country.

CHAPTER II.

RESEARCH.

The research policy of the Committee was outlined in the previous report. Briefly, subsidies are granted to Departments of Agriculture in the various cotton growing provinces and Indian States for specific investigations on cotton. These investigations include botanical schemes for breeding high yielding superior types of cotton, entomological schemes for the study of the life history of certain cotton pests and measures to combat them, mycological schemes for ascertaining ways and means to prevent loss due to fungoid diseases and physiological schemes for the study of crop growth and causes of bud and boll shedding. Until 1937, the entire expenditure on these schemes was borne by the Indian Central Cotton Committee, but, in view of the gradual depletion of its reserves owing to the annual expenditure exceeding the income, it was decided that the Provincial Governments, in future, should accept increasing responsibility for such of the schemes financed by the Committee as at the end of their sanctioned period were found to have produced results of definite value, in order that the savings thus effected might be released for utilisation by the Committee for extending its activities in other useful directions. The Provincial Governments and States have since been bearing an increasing share of expenditure on the schemes of the Committee. The policy in this connection is that research schemes are financed in full by the Committee up to a period of ten years, subject to review at the end of 3rd, 5th and 8th year. To justify further financial help from the Committee after this period, special technical or scientific reasons are necessary, particularly if the Committee's share is to exceed 50% of the total expenditure to which it is normally limited. Expenditure on seed schemes is divided into (1) cost of staff and (2) incidental charges on the distribution of seed of approved varieties less receipts, if any. The Committee bears either the cost of staff or the incidental expenditure, but not both. Seed schemes are sanctioned by the Committee for periods not exceeding five years, in the first instance, but they may be extended subsequently for a further period of five years on the condition that (a) the Committee's share of the expenditure in the second period should not exceed 75% either of the pay of the staff or incidental expenditure and (b) that the local Government concerned contributes not less than the sum spent during the original period of the scheme. It is not necessary, however, that the grant for the renewal

period should be less than for the first sanctioned period but the Committee's contribution should not exceed 75%. When a change in the variety under distribution is made with the approval of the Indian Central Cotton Committee, further continuance of the scheme is treated as a new seed distribution scheme and not as a renewal of the original scheme. After a seed distribution scheme has been in operation for a period of ten years the contribution of the Committee during the next five years is limited to 33% of the cost of the staff or incidental expenses, subject to a maximum of 15% of the total cost of the scheme during the extension period.

By means of progress reports and programmes of work, which are critically examined by Special Sub Committees appointed for the purpose a close touch is maintained with the work being done under the various schemes financed by the Committee. The procedure adopted is that, before being approved, all schemes are subjected to a thorough examination, first by Special Sub Committees of the Agricultural Research Sub Committee then by the full Agricultural Research Sub Committee and finally by the Indian Central Cotton Committee, subject to the financial aspect being further examined in detail by the Standing Finance Sub Committee.

The Committee also gives grants to Agricultural Departments and Co-operative Sale Societies (through Agricultural Departments) for the extension and marketing of improved varieties of cotton and the maintenance of nuclei of pure seed of approved strains of cotton for which, for the time being, there is no seed distribution scheme in operation. Whenever necessary, scholarships and training grants are also sanctioned for post graduate training in subjects pertaining to various aspects of cotton the selected candidate being sent abroad for the requisite training in the absence of adequate facilities being available in India.

During the year under report, there were 36 research schemes, 16 seed extension schemes, 2 marketing schemes and 4 nuclei schemes in operation, the total estimated cost of these being Rs 5,09,861. In addition, Rs 2,11,544 and Rs 1,11,000, respectively, were sanctioned for the work being done at the Committee's Technological Laboratory, Matunga and at the Institute of Plant Industry, Indore. The research work carried out under the auspices of the Committee during the year under review is described below under (1) Fundamental Research, (2) Research on Cotton Technology and (3) Cotton Research in Provinces and States.

1. FUNDAMENTAL RESEARCH.

Fundamental research on cotton genetics, physiology and agronomy is conducted at the Institute of Plant Industry, Indore. This Institute was established in 1924 with the object of providing a central research station for cotton in the black soil area of the Malwa Plateau, and is maintained by annual contributions from the Committee on the one hand and the Member States in Central India and Rajputana on the other. The management of the Institute is vested in the Governing Body, representation on which, in any financial year, is proportionate to the grants made by the Committee and the Member States during the previous financial year. During the year ending 31st March, 1940, the Committee contributed Rs. 1,11,000 and the Member States in Central India and Rajputana Rs. 35,460. As stated in Chapter I, the working of the Institute was re-organised during the year and the new arrangement came into force with effect from the 1st April, 1940. Under this, fundamental research on genetics and plant physiology has been separated from the plant breeding, extension and other work of the Institute and treated as a separate scheme—Cotton Genetics Research Scheme—which is to be financed entirely and controlled directly by the Committee. The work of the Cotton Genetics Research Scheme will be concerned with genetical investigations, methods of sampling, field plot technique and statistical investigations in relation to genetics. The grant to the Institute proper will, in future, be limited to Rs. 30,000, the contribution from the States being estimated at Rs. 40,000 per annum. The Institute will be responsible for the usual plant breeding work on cotton and other crops for the Member States, as well as seed multiplication, distribution and demonstration work, and such agronomical and chemical investigations as might be considered desirable for the benefit of the States.

Mr. T. R. Low continued as Director of the Institute throughout the year and Mr. K. Ramiah assumed charge of the Cotton Genetics Research Scheme, Indore, with effect from the 1st April, 1940. Mr. Ramiah represented the Committee at the International Congress of Genetics, held at Edinburgh in August 1939. Mr. V. G. Panse, who was deputed by the Committee in September 1938 for advanced training in statistics under Prof. R. A. Fisher at the Galton Laboratory, University of London, returned in May 1940, after completion of his training, and assumed charge of his duties as Statistician, attached to the Cotton Genetics Research Scheme, Indore.

A brief review of the work done at the Institute during the year is given below:—

Cotton Genetics.—The cytogenetics of the sterile mutant isolated from the Million Dollar has been worked out and the results have shown that the

sterility is due to anthesis caused by a single gene which freely assorts with genes *R*, *L* and *I*

Further work on the Punjab hairy lintless gene has shown that there is invariably a serious deficiency of the homozygous lintless class although at times a good 1 : 2 : 1 ratio of lintless : short linted : linted types does occur in crosses involving both related and unrelated backgrounds. The survival of the homozygous lintless appears to be due to some unaccountable behaviour of the homozygous lintless in the matter of viability which appears to vary from almost total failure to complete germination. Notes from other places like Coimbatore and Lyallpur have shown that the environment affects the viability of the seeds with the lintless gene differently. In all the places however the homozygous lintless type whenever it occurs is characterised by short internode, dwarfish habit and comparative lateness.

Further studies have been made with the genetics and interrelations of the 1027 *A L F* lintless gene *L_a*. A cross with a *R* gene showed a free assortment giving a 9 : 3 : 3 : 1 ratio for the genes *R* and *L_a*. Another cross with the narrow *Kokati* showed a free assortment with the leaf shape gene *L*. A study of the back crosses of the F_1 s of the above cross (heterozygous for lint colour) with 1027 *A L F* lintless parent confirmed the independent assortment of the lintless gene with the lint colour gene *K* whereas between *K* and *L* the usual linkage has been observed with about 32% crossing over.

The segregation results of the F_3 families of the cross 1027 lintless \times Punjab glabrous lintless confirmed the complementary nature of the genes *L_b* and *L_a*. It may be mentioned that two linted plants occurred in an F_3 of a lintless plant from Nandyal lintless \times Wajad lintless. A similar unexpected experience was met with in the progenies of the cross 1027 *A L F* \times Dharwar glabrous lintless also. The occurrence of a small number of linted plants in the progenies of *herbaceum* lintless mutants has also been reported from Surat. Further work is however required before a suitable explanation can be offered.

The identification of a new member of the anthocyanin allelomorph series in *Tellapatti* (*G. arborea* in var. *neglectum* forma *in lica*) reported last year has been confirmed from a study of the F_3 and backcross populations of all the crosses. A 1 : 2 : 1 ratio of red leaf spot : intermediate red leaf spot and green leaf spot was obtained in one complete F_2 of the cross *Tellapatti* \times *Malu*. The F_3 families of the cross *Tellapatti* \times *N6* selected for green leaf spot and ghost petal spot bred true in the F_3 generation, so also the families with green leaf spot and petal spot (*Tellapatti* type). F_3 families with red leaf spot and full

petal spot segregated once again as in F_2 . A study of the genetics of the petal colour was made on the crosses between a Chinese cotton type with a cream petal of the grade 5-6 darker than the cream (grade 2-3) and the three members of the allelomorphic series, Y , Y^p and y . The F_1 in all cases was Y of the grade (8-10) showing thereby the complementary nature of this new gene to both Y^p and y . The F_2 s and backcross progenies will be followed up for confirmation of the results.

A virescent yellow mutant occurred last year in the X-rayed material and it is interesting to note that this mutant with the yellow colour, which is seen at all stages in the young leaves, has been found to be viable in contrast to the chlorophyll deficient mutant of *Malvi*. Its inheritance is still under study.

The types obtained from the X-rayed material referred to in the previous report with a significantly different node number and ginning percentage as compared to the control were tested in a replicated experiment during the year. Only *E. B. 31* and *M. U. 4* maintained the significant differences over control in node number and ginning percentage, respectively, whereas the significant differences in node number of *C. 402* and in ginning percentages of *M. 9-20* and *C. 402* observed last year disappeared this year.

Genetic Variability.—The data obtained from the experiments conducted at the Institute in connection with the statistical study of quantitative inheritance and genetic variability formed the basis of the investigations conducted by the Statistician under the guidance of Prof. R. A. Fisher in London.

The present investigation deals with the inheritance of staple length based on the data from the F_2 and F_3 progenies of the crosses between three strains of *G. arboreum* var *neglectum*—*Bani*, *Malvi* and *C. 520*.

It has been shown that the genetic portion of the F_2 variance can be estimated from the regression of F_3 progenies on their F_2 parents, as this regression co-efficient is an estimate of the ratio, *genetic variance/total variance in F_2* . This is an important result of direct value to the plant breeder. The smallness of the genetic fraction in the cross *Malvi* x *Bani* has confirmed once again the previous finding that *Malvi* and *Bani* are genetically more closely related.

To study the statistical properties of the populations following each of the genetic hypotheses and the effect of selection in these populations, statistical methods based on the moment-generating functions of multi-variate

distributions were developed and these would appear to form a powerful general approach to problems on quantitative inheritance. By the application of these methods, certain statistical properties, such as the mean values, variances and covariances of F_2 progenies resulting from a portion of the F_2 population selected for the highest phenotypic values have been calculated. These theoretical values can be compared with actual values obtained from suitable experimental material in order to decide which of the hypotheses the experimental population follows most closely. They can also be used for studying the effect of selection in populations with different genetic constitutions.

Physiology.—An experiment was conducted during three previous years with two *Upland* cottons (from Dhar and Musakhari) to determine the effect of land on the quality of cotton. The crop was grown at Indore *barani* and at Kharua both *adhan* and *barani*. The results showed that the *adhan* land increases seed weight and that the effect is cumulative. In all the three years, the seed germinated better at Indore than at Kharua *adhan*. The *adhan* land appears to produce a larger proportion of immature seeds, which fail to germinate; the seeds, which germinate, produce more vigorous seedlings as a result of the greater seed vigour (shown in higher seed weight). The difference in the quality of cottons grown on *adhan* land and those grown on *barani* land is not so marked as in the previous year.

The study of the competition effect between the *Upland* and *desi* cottons was continued during the year. Investigations consisted of two experiments, one a repetition of last year's where *Malvi 9* was grown mixed with three cottons—another *Malvi* strain, *Verum* and an *Upland* strain—and the second experiment started for the first time, in which *Malvi 9* was grown mixed with 4 selected types of *Upland*. The results obtained were, however, contrary to those of the last year, demonstrating the effect of two extreme seasons, one with a high rainfall well distributed and another a droughty one with bad distribution. The first experiment would appear to indicate no material advantage in yield when *Malvi 9* is mixed with the two *desi* types. The technological tests on the mixture of the two types, however, again showed better fibre properties than the mean of the components and approached more nearly the better of the two components.

In the new experiment with mixtures of *Malvi 9* and four selected *Upland* types, Indore I, *M. U. 4*, *Buri 107* and *x4463*, due to the unfavourable season, the pure plots of *Upland* cottons yielded very low, whereas the mixtures were just as good as pure *Malvi 9*, except in the case of the mixture of *Malvi 9* with *Buri 107*. Observations were recorded on the incidence of red

A number of the more promising selections in Nimari cotton, from the previous year's trials, were tested in Nimar; these included *Banilla*, *Jarila* and *Verum 424*. Significant differences were obtained only in respect of ginning percentage in which character *Banilla* and *Jarila* varieties were found to be outstanding. Though the yield behaviour of *Jarila* was not very convincing it was better than the local in both lint length and ginning percentage. Gins mills and cultivators have shown a preference for this cotton and the area under it is reported to be rapidly increasing.

In addition to the above trials, selection is also being continued in the acclimatised American cottons of Malwa. One of the selected strains, *M.U. 4* has now reached a stage when it can be recommended for cultivation. This strain along with a sister strain, *Buri 107* from the Central Provinces and Berar, *Indore I* (an Upland strain that was distributed for cultivation in irrigated tracts of Rajputana) and 3 *Cambodia* crosses was tested at two centres, Indore and Badnawar in Dhar State. The results of this trial have brought out that the only cotton that compares favourably with *M.U. 4* is *Indore I*.

19 families of the fertile interspecies hybrids received from Surat were sown at Indore under pre-monsoon conditions on irrigated land. Most of the plants proved to be late for Malwa conditions and some selections have been made for trial in the ensuing year.

Seed Multiplication and Distribution.—435 *maunds* of improved cotton seed (401 *maunds* of *Malvi 9* and 34 *maunds* of *Malvi 9-20*) were collected during the year, mainly from the seed multiplication area in the villages adjacent to the Institute; 10½ *maunds* were reserved for farm sowings, 257 *maunds* were distributed to the contributing States for multiplication, and the remaining quantity was given to the cultivators in the neighbouring villages. An area of nearly 600 acres under *Malvi 9* and *Malvi 9-20* in these villages is directly under the supervision of the Institute and periodical visits are paid to rogue the crop and to note the incidence of wilt in particular fields, so that when the cotton is brought to the farm by the cultivators, the produce from the wilt infected fields might be kept separate and not used for seed purposes. Of the 1939-40 crop, only the produce from the first and second pickings was bought by the Institute, the later pickings being taken by the cultivators directly to the local market with a certificate that the produce is from the crop raised from the seed supplied by the Institute. 602 *maunds* of *kapas* of *Malvi 9* and *M. 9-20* was brought and ginned at the Institute and 373 *maunds* of seed was reserved for distribution.

The Holkar State is, in addition, arranging for large scale multiplication and distribution of *M 9* seed and, during the year, 216 maunds of *Malvi 9* lapas was ginned for them at the Institute

The technological tests on *Malvi 9* and *M 9 20* show that they resemble each other closely in respect of fibre properties, waste losses, evenness and nepiness of yarns, but *M 9 20* gives, on the whole, somewhat stronger yarns than *M 9*. This conclusion is corroborated by the mill tests which also show a small advantage in favour of *M 9 20*.

2 RESEARCH ON COTTON TECHNOLOGY.

The Committee maintains a well equipped Technological Laboratory where research on cotton technology is carried on. In addition trained Technological Assistants are stationed at Lvallpur, Sakrand, Cawnpore, Surat Dharwar, Coimbatore and Parbhani to help the cotton research officers in charge of Committee's research schemes in the provinces for the improvement of cotton. The Annual Report of the Technological Laboratory is issued as a separate publication, and here, therefore, only a brief summary of the work done is given.

Samples are tested at the Laboratory under the following groups —(a) agricultural samples, (b) samples of standard Indian cottons (c) trade samples and (d) technological samples. Agricultural samples represent either new or improved varieties under trial by Agricultural Departments or old types grown in connection with certain field experiments. The number of samples received under this head, during the year under review, was 342 against 305 in the previous year. The samples of standard Indian cottons mostly represent improved varieties grown on a commercial scale. During the year tests under this head were done on *Verum 262* (Nagpur), *Late Verum* (Nagpur), *V 434* (Akola), *Verum 262* (Akola) and *Umri Bani*, and the results were published as usual. The trade samples fall under two heads —(i) those supplied by the East India Cotton Association representing the fair average quality of different varieties of Indian cotton which form the bulk of the cotton crop and (ii) those supplied under arrangement with the Bombay and Ahmedabad Millowners' Associations, representing the early arrivals of the various Indian cottons in the local markets. Altogether ten samples of the first category and 11 of the second were tested during the year and the results were published in circulars which were distributed to the trade and industry.

The total number of samples received at the Laboratory for various tests during the year was 768 showing an increase of 21% over those of last year and 120% over the average of the last ten years. The increase was due not

merely to the development of the Laboratory's older activities, but also to the inauguration of new activities such as the Testing House. The various cotton gins and mills are beginning to take advantage of the facilities provided by the Laboratory to an increasing extent. With the installation of a de-humidifying plant, the temperature and humidity in the spinning and the testing rooms can now be maintained at a uniform level throughout the year, regardless of the atmospheric conditions prevailing outside.

Among the agricultural samples tested during the year were: *Hyderabad-Maorani* and *Bani 306*, grown in the *kharif* season in parts of Raichur district possessing chalka (granite) soil; *Segregate 8-1*, which is a promising cross between *1027 A.L.F.* and *1A Long Boll*; *Punjab-American 289-F*, grown in Bengal, and *Garro Hill cotton*, grown in Assam. The fibre-weight per inch of *Garro Hill cotton*, of which the lint is short and very coarse, was probably the highest recorded in the Laboratory. Owing to its rough feel and high fibre-weight per inch, this cotton is well suited for mixing with short staple wool or for such other non-textile purposes as the manufacture of gun cotton and hospital lint, etc.

During the period under review, a formula was evolved for predicting the single-thread strength of any specified count from the known strength of a count. The investigation on the effect of different treatments of kier boil and bleach on the quality of yarns spun from Indian cottons, undertaken jointly with the Department of Chemical Technology of Bombay University, was completed and an account of the first part of this investigation was sent for publication. Investigation of the spinning quality of mixtures made from Indian cottons and staple fibre, which was started sometime ago, was continued with special reference to the optimum conditions for processing such mixtures and brought near completion. The effect, on the spinning behaviour of Indian cottons and the quality of yarn, of using different beater speeds in the Crighton opener and the scutcher, of giving different numbers of treatments in these machines and of employing different sequences of machines in the blow-room was tested. The divergence between mill and Laboratory tests was studied by the carrying out of actual tests on the same cottons at the Laboratory and in three local mills. The results showed considerable variation from mill to mill, and, in view of this, it was decided to extend these tests to more Indian cottons and to a large number of samples. With a view to finding non-textile uses for Indian cottons, the possibilities of making cotton belting, artificial leather, cotton cloth for road construction, cotton cloth for use in place of hessian and cotton bags for sugar, flour and cereals, are being examined at the Laboratory.

Fifteen samples of linters of the 1938-39 crop and 23 samples of 1939-40 crop were subjected to mechanical and chemical analysis, and have also been graded against the official American standards of which a complete set was obtained for this purpose. The preliminary examination of the data has shown that, as compared with the 1938-39 crop, a considerable improvement is noticeable in the quality of linters of the 1939-40 crop.

Most of the machinery for the proposed ginning section was received during the year and will be erected as soon as the building for this section is completed.

3. COTTON RESEARCH IN PROVINCES AND STATES.

In the various cotton growing Provinces and States, the Committee finances several agricultural research schemes for the development and improvement of cotton growing. Some of these schemes are financed entirely by the Committee, while the cost of others is met partly by the Committee and partly by the Provincial Government concerned. The following paragraphs describe briefly the schemes in operation in the various provinces, their object and the progress made during the year under review.

(i) BOMBAY.

(a) **Broach Cotton Breeding Scheme.**—The Cotton Breeding Scheme at Broach was sanctioned in December 1931, for a period of five years, and came into operation in April 1932. In August 1936, it was extended for a further period of five years. The original object of this scheme was to obtain, by selection or hybridization, suitable types of cotton possessing wilt-resistant, high yielding, high ginning and superior spinning qualities, to replace the local mixture, a large proportion of which consisted of *Goghuri*, a short staple, high ginning (40%) variety. In view, however, of the Committee's policy to replace, wherever possible, short staple with medium and long staple cottons, attention is now being concentrated on wilt resistance, high yield and fibre length.

The breeding of wilt-resistant types originally formed part of the Broach and Jalgaon Cotton Breeding Schemes but, as it was considered desirable that the testing of cotton strains should be done under the optimum conditions of wilt infection, and, as experience showed that these conditions, especially soil temperature in pots, were difficult to maintain at Broach and Jalgaon, the work was transferred to Poona in June 1935.

In August 1936, the wilt part of the two schemes was extended for a period of five years from the 1st April, 1937, and it was decided that it should be treated as a separate scheme from the 1st April, 1937.

The progress made during the year in connection with the breeding work at Broach and the Wilt Breeding Scheme at Poona is given below :—

11 segregates, *viz.*, 7 from the original lot of 14 mentioned in the last year's report, and 4 new ones—two from (*B. D. 8* × *G. A. 26*) × *B. D. 8*, one from each of the crosses (*B. D. 8* × *S. 7-1*) and *B. D. 8* × (*B. D. 8* × *S. 12-1*)—were tried in replicated plots. From the trials of the single plant progenies of the 4 new segregates, both in wilt-infected and wilt-free soils, it was found that *Segregates 3-1* and *7-29* were promising in respect of resistance to wilt, yield of seed cotton per acre, ginning percentage and fibre length.

The progeny bulk trials of the 11 segregates in wilt-free soil showed that while the average fibre length of all was equal to that of *B. D. 8*, only *Segregates 1-6* and *5-18* were definitely superior to the local variety in ginning outturn. The spinning test results of the previous two seasons have shown that all the segregates possess qualities for high spinning, above 37 highest standard warp counts against 16's of the local variety. *Segregate 1-6* gave appreciably more yield than the local variety and in ginning outturn it has proved to be the best strain. Absence of any mortality and only partial wilting during the last three seasons, even when grown in a thoroughly wilt-infected plot, indicate that all the segregates are as resistant as *B. D. 8* under field conditions.

Under the wilt breeding part of this scheme, the object is to evolve a cent percent wilt-resistant type from the material available at Broach. It is hoped that some cultures of *B. D. 8*, *viz.*, *B. D. 8-B₄* and *B. D. 8-B₇*, will ultimately attain homozygosity for 100 per cent wilt resistance. The progenies of *N. S. 12* are still segregating and further tests will be continued. The back-cross, (*B. D. 8* × *G. A. 26*) × *B. D. 8*, continued to show a very high degree of wilt resistance and there are indications that 100 per cent wilt resistant cultures may be obtained. The cross (*B. D. 8* × *N. S. 12*) and the back-cross with *B. D. 8* have also shown a very high degree of wilt-resistance and are rapidly approaching homozygosity as regards complete resistance. In the Russian *herbaceums*, the culture *2761-1* was found to be completely free from wilt. The cross (*B. D. 8* × *S. 7-1*) *F₅* and the back-cross {(*B. D. 8* × *S. 12-1*) × *B. D. 8*} *F₃* have also shown almost complete resistance to wilt.

A nucleus of pure seed of *B. D. 8* strain which is being distributed in the district since 1935-36 was maintained.

(b) 'Jalgaon Cotton Breeding Scheme.—This scheme was sanctioned in December 1931 for a period of 5 years and started work in April 1932.' It was extended in August 1936 for a further period of 5 years. The original object of this scheme was to obtain, by selection or hybridisation, suitable wilt-resistant types with heavy yielding, high ginning and good spinning qualities, to replace the local mixture of *N.R.* and *Banilla* cottons in Khandesh. Wilt breeding work was originally included in the Broach and Jalgaon Cotton Breeding Schemes, but, in August 1936, it was decided that the wilt work should be treated as a separate scheme from the 1st April, 1937, and continued for a further period of five years.

The 120 plant selections of Dokras cotton from Chandur mentioned in the last year's report were increased to 121 and tested in line cultures for their economic characters and resistance to wilt. Out of these, 23 were found to be superior to *Jarila* in ginning percentage and either equal or superior to it in staple length. Three of the best plants from each of these lines will be tested for yield and resistance to wilt during the ensuing year. With the object of incorporating into *Jarila* the high ginning percentage of *N.R.* and cent percent wilt resistance of the *New Million Dollar*, the following cross was made :—

{*Jarila* \times *N.R.5*} F_1 \times *New Million Dollar* } F_1 .

From the large number of segregates tested, 124 plants, with a staple length of 24—27.6 mm. and a ginning percentage ranging from 39 to 45.2 coupled with wilt resistance, have been selected for tests during the ensuing year. The F_1 plants of the cross—*Jarila* \times *New Million Dollar*—made with the same object as above, were back-crossed with *Jarila* and the seeds obtained from this material will be grown in wilt-infected plot during the coming year.

The F_2 of the cross—*Jarila* \times *N.R. 5*—was examined to see whether any segregate combining the economic characters of *Jarila* and the higher ginning of *N.R. 5* could be isolated. Out of 741 plants of this cross, which were under observation, 36 plants, possessing a staple length of 23.6 to 26.4 mm. and a ginning percentage of 39—44.7 were finally selected for trial.

Six plants selected from three sub-cultures of *Jarila* have been sent to Poona for complete elimination of the susceptibles.

In August 1956, the wilt part of the two schemes was extended for a period of five years from the 1st April, 1957, and it was decided that it should be treated as a separate scheme from the 1st April, 1957.

The progress made during the year in connection with the breeding work at Broach and the Wilt Breeding Scheme at Poona is given below.

Eleven segregates, viz., 7 from the original lot of 14 mentioned in the last year's report, and 4 new ones—two from $(B.D. 8 \times G.A. 26) \times B.D. 8$, one from each of the crosses $(B.D. 8 \times S. 7-1)$ and $B.D. 8 \times (B.D. 8 \times S. 12-1)$ —were tried in replicated plots. From the trial of the single plant progenies of the 4 new segregates, both in wilt infected and wilt free soil, it was found that Segregates 5-1 and 7-29 were promising in respect of resistance to wilt, yield of seed cotton per acre, ginning percentage and fibre length.

The progeny bulk trials of the 11 segregates in wilt free soil showed that while the average fibre length of all was equal to that of *B.D. 8*, only Segregates 1-6 and 5-18 were definitely superior to the local variety in ginning outturn. The spinning test results of the previous two seasons have shown that all the segregates possess qualities for high spinning, above 37 highest standard warp count against 16½ of the local variety. Segregate 1-6 gave appreciably more yield than the local variety and in ginning outturn it has proved to be the best strain. Absence of any mortality and only partial wilting during the last three seasons, even when grown in a thoroughly wilt-infected plot, indicate that all the segregates are as resistant as *B.D. 8* under field conditions.

Under the wilt breeding part of this scheme, the object is to evolve a cent percent wilt-resistant type from the material available at Broach. It is hoped that some cultures of *B.D. 8*, viz., *B.D. 8-B₄* and *B.D. 8-B₇*, will ultimately attain homozygosity for 100 per cent wilt resistance. The progenies of *N.S. 12* are still segregating and further tests will be continued. The back-cross, $(B.D. 8 \times G.A. 26) \times B.D. 8$, continued to show a very high degree of wilt resistance and there are indications that 100 per cent wilt resistant cultures may be obtained. The cross $(B.D. 8 \times N.S. 12)$ and the back-cross with *B.D. 8* have also shown a very high degree of wilt-resistance and are rapidly approaching homozygosity as regards complete resistance. In the Russian *herbaccums*, the culture 2761-1 was found to be completely free from wilt. The cross $(B.D. 8 \times S. 7-1) F_5$ and the back-cross $\{(B.D. 8 \times S. 12-1) \times B.D. 8\} F_3$ have also shown almost complete resistance to wilt.

A nucleus of pure seed of *B.D. 8* strain which is being distributed in the district since 1935-36 was maintained.

(b) **Jalgaon Cotton Breeding Scheme.**—This scheme was sanctioned in December 1931 for a period of 5 years and started work in April 1932. It was extended in August 1936 for a further period of 5 years. The original object of this scheme was to obtain, by selection or hybridisation; suitable wilt-resistant types with heavy yielding, high ginning and good spinning qualities, to replace the local mixture of *N.R.* and *Banilla* cottons in Khandesh. Wilt breeding work was originally included in the Broach and Jalgaon Cotton Breeding Schemes, but, in August 1936, it was decided that the wilt work should be treated as a separate scheme from the 1st April, 1937, and continued for a further period of five years.

The 120 plant selections of Dokras cotton from Chandur mentioned in the last year's report were increased to 121 and tested in line cultures for their economic characters and resistance to wilt. Out of these, 23 were found to be superior to *Jarila* in ginning percentage and either equal or superior to it in staple length. Three of the best plants from each of these lines will be tested for yield and resistance to wilt during the ensuing year. With the object of incorporating into *Jarila* the high ginning percentage of *N.R.* and cent percent wilt resistance of the *New Million Dollar*, the following cross was made :—

$$\{ \{ \textit{Jarila} \times \textit{N.R. 5} \} F_1 \times \textit{New Million Dollar} \} F_1$$

From the large number of segregates tested, 124 plants, with a staple length of 24—27.6 mm. and a ginning percentage ranging from 39 to 45.2 coupled with wilt resistance, have been selected for tests during the ensuing year. The F_1 plants of the cross—*Jarila* \times *New Million Dollar*—made with the same object as above, were back-crossed with *Jarila* and the seeds obtained from this material will be grown in wilt-infected plot during the coming year.

The F_2 of the cross—*Jarila* \times *N.R. 5*—was examined to see whether any segregate combining the economic characters of *Jarila* and the higher ginning of *N.R. 5* could be isolated. Out of 741 plants of this cross, which were under observation, 36 plants, possessing a staple length of 23.6 to 26.4 mm. and a ginning percentage of 39—44.7 were finally selected for trial.

Six plants selected from three sub cultures of *Jarila* have been sent to Poona for complete elimination of the susceptibles.

In the trials of *Jarila* and local cotton, conducted at 36 centres in Khandesh and a part of Nasik district, *Jarila* gave higher yields than the local in 20 centres, lower in 7 and equal in the remaining 9. The ginning percentage of *Jarila* ranged from 32 to 35.5.

Jarila, *Banilla* and *N.R. 6* were tested for yield at Jalgaon, Bhadgaon and Dhulia farms. *Jarila* gave significantly higher yield than *N.R. 6* at Bhadgaon and *N. R. 6* and *Banilla* at Dhulia. The samples of *Jarila* from these farms gave 26 to 30 highest standard warp counts. The lint was valued at Rs. 16 to Rs. 18 'ON' Broach at Ahmedabad and Rs. 52 to Rs. 60 over Oomras at Bombay. The premium realised at the auction sales ranged from Rs. 13 to Rs. 34 'ON' Broach.

200 lbs. of selfed seed were obtained from the nucleus of pure seed maintained at Jalgaon farm.

Work under the wilt breeding section of this scheme conducted at Poona consisted of testing the selfed seed of *Million Dollar*, *New Million Dollar* and *Chinese R1 Spotless 51*, under optimum conditions of infection. Tests over a series of seasons have shown that these strains have now reached a stage when they may be said to be 100 per cent resistant to wilt.

Crosses between the Khandesh types and the resistant strains were tested to ascertain the degree of susceptibility and to study the inheritance of wilt resistance.

(c) **Scheme for breeding wilt-resistant cottons in Surat area.**—This scheme was sanctioned by the Committee in August 1936 and commenced work in April 1937. The object of the scheme is to obtain a strain of cotton completely resistant to wilt and suited to the natural conditions obtaining in the Surat tract. This is sought to be achieved either by selection in *1027 A.L.F.* or by crossing this cotton with *B.D. 8* or other wilt resistant strains.

The testing work during the year was carried out in the wilt-infected plot at Shera.

The progenies of 12 plants of *1027 A.L.F.* selected for wilt resistance at Surat and tested at Shera gave three cultures with nil mortality, although they still showed partial wilting. It is proposed to continue the study of two of these cultures, viz., 63-36 and 66-274, which possess high ginning and long staple qualities.

The F_1 populations of the following four crosses were tested for wilt resistance, no mortality was recorded in 1 2 and 4 and only partial wilting ranging from 2 8% to 45 7% was observed in 2, 3 and 4 —

- 1 $(8-1 \times K F)$
- 2 $(8 I \times B D 8)$
- 3 $[8 I \times \{(B D 8 \times G A 26) \times B D 8\} F_6 1 6] F_1$
- 4 $[1027 A L F \times \{(B D 8 \times G A 26) \times B D 8\} F_6 1 6] F_1$

$8 I \times K F$ alone was conspicuous by the absence of deaths and even partial wilting

The absence of mortality from wilt in a population of 107 plants, obtained from a resistant selection of *Segregate 8 I* indicates that the latter is probably pure for resistance

(d) Scheme for improvement of Wagad cotton at Viramgam and Jagudan —While examining the possibility of growing medium and long staple cottons in the short staple areas of India the Committee in August 1935, decided that, in view of the absence of any serious attempt to improve the cotton of the large *Dholletas* tract a comparative study of Indian and Iranian *herbaceum* cottons should be undertaken with the object of finding out one or more suitable types for the tract. A special officer from the Institute of Plant Industry Indore was deputed to Iran to collect *herbaceum* types of cotton grown there and in August 1936 a five year scheme was sanctioned for the improvement of *Wagad* and *Matho* cottons the work on *Wagad* cottons being centred at Viramgam and that of *Matho* at Amreli. Simultaneously, a small immune area was maintained at Jagudan under irrigation to safeguard the work at Viramgam.

The objects are the improvement of the *Wagad* cottons for (a) quality and yield and (b) earliness in order to escape frost and the replacement, if possible of the inferior *Matho* cotton of Kathiawar by early *herbaceum*. These are sought to be achieved by (a) selection in *Wagad* cotton (b) hybridisation with Surti Broach quality cottons like 1027 A L F and B D 8 and (c) hybridisation with Iranian *herbaceums* known to be early and of better quality.

During the year under review unit selections were made from 17 families of the local *Wagad* for yield ginning percentage and lint length. From 5

supplied by the Department to cultivators in Surat area, excluding those purchased by the people direct. The percentage of the area cleared up before the 15th May 1940 with plant puller in Ambusar taluka was 92% 98% in Broach and 95% in Vagra. The percentage of uprooting in Ambusar was 50 while in the three talukas of Ankleswar, Oldad and Chorashi the area uprooted was 49 70 and 66%, respectively as against 44 65 and 61% in the previous year.

(1) Scheme for inclusion of Northern and Western cottons in programme of work of Dry Farming Scheme at Bilapur—This scheme was sanctioned by the Committee in August 1936 and is the outcome of the recommendations of the Agricultural Research Sub Committee which, while considering the subject of the possibility of growing long and medium staple cottons in the short staple cotton areas like the Bilapur district in the Hyderabad State where the rainfall is limited and precarious a solution of the problem might be found in devising suitable dry farming methods. The scheme came into operation in June 1937.

The season during the year under report was an average one from the point of rainfall. The work under the scheme was divided into two parts. In the first part, six replicated and randomised experiments were laid out to test the comparative performance of the four strains viz *N F F H I Jaya* and the local *Kumpla* and the effect on them of *F V VI* and castor cake manuring, tillage, bunding, intercultural spacing rotation following and green scale under the Bombay Dry Farming method.

In the second part *Northerns* and *Westerns* cottons were tried on a field cultivators' method.

Experiment I which was laid down to test the comparative performance of varieties supplemented by manures gave significantly different yields of *Local Kumpla* and *Jaya* than *N F F I V VI* and castor cake gave significantly higher yields than the unmanured plots.

Experiment 2 was laid out with the object of ascertaining the advantages of three different types of preparatory tillage viz, ploughing, the tooth harrowing and blade harrowing. The results did not show any significant differences in yield.

Experiment 3 was designed to assess the value of bunding *versus* no bunding and the value of mulch over no mulch in bunded and non-bunded plots. The results were not significant.

Experiment 4 was laid down to determine the optimum plant population per unit area with different spacings. The results were not significant, but the largest yield was obtained with 18" × 12" spacing.

Experiment 5 was laid out to ascertain the advantage of rotating cotton with *jowar* over cotton year after year. The results were not significant though cotton after *jowar* gave 17% more yield during the year than cotton after cotton.

Experiment 6 was designed to assess the value of fallows, *viz.*, (1) clean fallow in the previous year followed by cotton, (2) cover fallow, *i.e.*, *sann* green manured fallow in the previous year followed by cotton and (3) cotton followed by cotton. None of the treatments was found to be significantly superior to the other two, though numbers 1 and 2 gave respectively 20 and 23% more yield than No. 3.

In the large scale field trials of *Northerns* and *Westerus* under the Bombay Dry Farming method, the highest yield was obtained when all the six treatments, *viz.*, ploughing, bunding, manuring and harrowing, wide spacing and greater numbers of intercultures, were included. Addition of F. Y. M. resulted in increasing the yield of the two cottons as compared to the local cultivator's method.

(g) Scheme for interspecific hybridisation in cottons at Surat.—This scheme was sanctioned by the Committee in January 1938, for a period of five years, with the object of obtaining, if possible, fully fertile hybrids between Asiatic and American cottons, combining the useful agronomic characters of both, particularly, the good staple length of the American and hardness and adaptability to Indian climate of the Asiatics.

Prior to the commencement of the scheme, work on crossing Asiatic and American cottons was undertaken at Surat in 1932, with the result that 23 hybrids had been obtained, in which the American parents used were mostly of the acclimatised *Upland* from different parts of India, while the Asiatic parents were forms of *G. herbaceum* and *G. arboreum*. The hybrids produced from these were, however, sterile and efforts to induce fertility in them were unsuccessful only when they were back-crossed to American types. As a result, 27 first back-cross plants were raised successfully, 15 of which were found to

be more or less fertile. By crossing Co 2 (*G. hirsutum*) with Red *arboresum* (*G. arboresum*) and back crossing the F₁ to Co 2, one plant, viz., B C No 22 was obtained, which was found to be fully fertile, combining the characters of both the parents

During the year under report, all the F₁ hybrids and first back crosses were maintained as ratoons and propagated vegetatively by cuttings and graftings. The F₁ hybrids, though vigorous and flowering profusely, were sterile and to bring about fertility in them, three methods were tried, viz. (1) back crossing, (2) physical treatment and, (3) chemical treatment. Nearly 2,25,000 flowers of the hybrid plants were back crossed and 63 bolls with 64 seeds were obtained. The second method failed to give the desired results. The chemical treatment, known as the "Drop" method of applying colchicine to growing buds and tips of shoots was tried on the germinated seeds of the hybrids for a month, 4 out of 17 sterile hybrids showed apparent signs of doubling of chromosomes

Of the 8 fertile back crosses of 1937 38 maintained as ratoons one No 22 [(Co 2 × Red *arboresum*) F₁ × Co 2] F₁ appears promising in respect of fibre properties and selection is being made from the F₂ and F₃ generations. Of the six back-cross plants of 1938 39 one [(D A 2 6 5 × Gaorum 6) F₁ × D A 2 6 5] F₁ has been found to give healthy and early selections in F₂ and these will be tested in the ensuing year. Of the 4 600 plants of the F₂ of B C [(Co 2 × Red *arboresum*) F₁ × Co 2] F₁, which were under observation 51 plants were selected for resistance to jassids and red leaf blight. These selections give 30% to 41% possess staple length of 26 to 33 mm and have a distinctly silky feel. From the 37 progenies of individual plant selections from F₂ of B C No 22 [(Co 2 × Red *arboresum*) F₁ × Co 2] F₂ 3 progenies—(family Nos 7, 16 and 26)—were found to be superior in respect of fibre characteristics.

The cytological study at Indore of the original hybrids revealed that 21 of them were triploids with 36 chromosomes, one a tetraploid (2n=52) and one pentaploid (2n=65)

Cytological work is now under way

(11) SIND.

(a) Scheme for Cotton Jassid Investigation—In Sind, jassid attack is most prevalent in the south east Tharparker district where it is proposed to establish a compact block of long staple cotton. One of the harmful effects of this pest is improper development of the seed, so that, in certain seasons,

Experiment 3 was designed to assess the value of bundling *versus* no bundling and the value of mulch over no mulch in banded and non-banded plots. The results were not significant.

Experiment 4 was laid down to determine the optimum plant population per unit area with different spacings. The results were not significant, but the largest yield was obtained with $18" \times 12"$ spacing.

Experiment 5 was laid out to ascertain the advantage of rotating cotton with four over cotton year after year. The results were not significant though cotton after four gave 17% more yield during the year than cotton after cotton.

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(g) Scheme for interspecific hybridisation in cottons at Surat.—This scheme was sanctioned by the Committee in January 1938, for a period of five years, with the object of obtaining, if possible, fully fertile hybrids between Asiatic and American cottons, combining the useful agronomic characters of both, particularly, the good staple length of the American and hardness and adaptability to Indian climate of the Asiatics.

Prior to the commencement of the scheme, work on crossing Asiatic and American cottons was undertaken at Surat in 1932, with the result that 23 hybrids had been obtained, in which the American parents used were mostly of the acclimatised *Upland* from different parts of India, while the Asiatic parents were forms of *G. herbaceum* and *G. arboresum*. The hybrids produced from these were, however, sterile and efforts to induce fertility in them were successful only when they were back-crossed to American types. As a result, 27 first back-cross plants were raised successfully, 15 of which were found to

be more or less fertile. By crossing *Co 2* (*G. hirsutum*) with *Red arboreum* (*G. arboreum*) and back crossing the *F1* to *Co 2*, one plant, viz. *BC No 22* was obtained, which was found to be fully fertile, combining the characters of both the parents.

During the year under report, all the *F1* hybrids and first back crosses were maintained as ratoons and propagated vegetatively by cuttings and graftings. The *F1* hybrids though vigorous and flowering profusely, were sterile and to bring about fertility in them, three methods were tried viz. (1) back crossing, (2) physical treatment and, (3) chemical treatment. Nearly 2,25,000 flowers of the hybrid plants were back crossed and 63 bolls with 61 seeds were obtained. The second method failed to give the desired results. The chemical treatment, known as the "Drop" method of applying colchicine to growing buds and tips of shoots was tried on the germinated seeds of the hybrids for a month, 4 out of 17 sterile hybrids showed apparent signs of doubling of chromosomes.

Of the 8 fertile back crosses of 1937 38 maintained as ratoons, one *No 22* [*(Co 2* \times *Red arboreum*) *F1* \times *Co 2*] *F1* appears promising in respect of fibre properties and selection is being made from the *F2* and *F3* generations. Of the six back-cross plants of 1938 39 one [*DA 2 6 5* \times *Gaurim 6*] *F1* \times *DA 2 6 5* [*F1* has been found to give healthy and early selections in *F2* and these will be tested in the ensuing year. Of the 4 600 plants of the *F2* of *BC* [*(Co 2* \times *Red arboreum*) *F1* \times *Co 2*] *F1*, which were under observation, 51 plants were selected for resistance to jassids and red leaf blight. These selections possess staple length of 26 to 33 mm and have a distinctly silky feel. From the 37 progenies of individual plant selections from *F2* of *BC No 22* [*(Co 2* \times *Red arboreum*) *F1* \times *Co 2*] *F1* 3 progenies—(family Nos 7, 16 and 26)—were found to be superior in respect of fibre characteristics.

The cytological study at Indore of the original hybrids revealed that 21 of them were triploids with 36 chromosomes, one a tetraploid (2n=52) and one pentaploid (2n=65).

Cytological work is now under way

(ii) SIND.

(a) Scheme for Cotton Jassid Investigation.—In Sind, jassid attack is most prevalent in the south east Tharparker district where it is proposed to establish a compact block of long staple cotton. One of the harmful effects of this pest is improper development of the seed, so that, in certain seasons,

good seed is not available for sowing purposes, and this gives a setback to the extension of improved varieties. Accordingly, in August 1937, the Committee sanctioned the above scheme, for a period of three years and six months, with the object of studying the habits of jassids, their alternative hosts and the manner in which certain varieties of cottons resist jassid attack. The progress made during the period under review is described below:—

The study of the incidence of jassid attack on different varieties of cotton was continued. This showed that the incidence was higher on *Sind Sudhar* and *4F-98* cotton than on *Punjab-American* and *Buri 107*, when sown on the same date; with different sowings, the earliest sown, irrespective of variety, was attacked the least. It was also observed that the jassid population in all varieties was insignificant during the month of May and the first fortnight of June, but increased in all during the 2nd fortnight of June. It was highest in the month of July in the April-sown cottons, whereas it reached the peak in the month of August in the May sown crop. From the point of view of yield, no definite conclusion could be drawn regarding the effect of the jassid population, varieties with smaller populations giving lower yields and *vice versa*. *M4* was found to be significantly superior to *Sind Sudhar*, *4F-98*, *P. A.* and *Buri 107* at 1% level of significance. Of the two species of jassids met with on cotton in Sind, *Empoasca devastans* dist. had been found to predominate. These species had been found to live and breed on other host plants like Bhindi (*Hibiscus esculentus*), Brinjal (*Solanum melongina*), Potato (*Solanum tuberosum*), Phalsa (*Grewia asiatica*), Hollyhock (*Althea rosea*) and *Abutilon indicum*. Observations made on the nature of resistance to jassid showed that, although some jassid resistant varieties have been found to be typically very hairy on the undersurface of the leaves, all hairy varieties are not necessarily resistant. For instance, *4F-98*, which is exceedingly hairy, was found to be comparatively more susceptible to jassid attack. Hairiness, therefore, does not appear to be a reliable character in determining the resistance of a plant. It is thought, however, that resistance may be associated with the length, toughness and density of the hairs and this aspect will be studied in the coming year. Toughness of the leaf veins and thickness of the epidermis are two other characters which will be studied in this connection. It is proposed also to study the effect of such cultural practices as spacing, manuring and watering, etc., on the degree of resistance of the plant.

(b) Scheme for investigation into Black-headed Cricet in Sind.—This scheme was sanctioned by the Committee in January 1938, for a period of three years, with the object of establishing the identity of the pest and studying its life history, seasonal behaviour and the extent of the damage caused.

(c) Scheme for production of long staple cottons in Sind—Sind is the only Province in India which may be said to be suited for the production of long staple quality cottons of the Egyptian and Sea Island types. The failure to establish such cottons in the past has been largely due to inadequate water supply and lack of suitable acclimatised material. Since the inauguration of perennial irrigation under the Lloyd Barrage in Canals system, however, the chief obstacle in the development of long staple cottons in Sind has been removed and experience has shown that high yields can be obtained from such cottons under favourable climate and soil conditions. Under adverse conditions however the yields obtained are low. This is probably due to extreme susceptibility of these cottons to environmental factors, such as extremes of temperature, water deficiency in the soil, desiccating action of hot winds, etc. Although, therefore, some headway has been made, long staple quality cottons have not yet established themselves, as major commercial crops.

Four species of crickets are been found to attack cotton and several other crops. The commonest and the most virulent has been identified as *Gryllus domesticus* Lin and is being studied in detail the duration of the various stages in its cycle seasonal behaviour, habits and feeding habits have been studied. The pest was met with mostly in the nymphal stages of development. The nymphs were rarely seen in nature however, the various generations overlap and crickets of all stages are met with at the same time. The pest causes damage to cotton not only directly by depositing the seed and feeding on it but also indirectly by limiting the extension of the crop. The damage caused by the cotton crop is estimated at one lakh rupees during the year under report. The pest was found to attack various crops in the months of July and August and during the rest of the year.

by it. Before the opening of the Lloyd Berrigo, the Black headed Criket had been known in occasional pest of *Sorghum* and cotton in Upper Sind and some parts of the Punjab. With the introduction of cotton cultivation on the Right Bank of the Indus, however this insect has become a serious pest of cotton in the seedling stage in Jhittir and John tracts in Sind and in some parts of Baluchistan. The pest appears in the cotton fields towards the end of April and disappears in June. The periods of its activity synchronises with the sowing time of cottons and causes almost wholesale destruction of the crop. The pest appears to belong to the same species as met with in Baluchistan viz *Gryllus domesticus*. The progress made during the year is described below —

of the cotton crop in Sind. Ever since the opening of the Lloyd Barrage cottons in Sind has engaged the attention of the Indian Central Cotton Committee. Although attempts in the introduction of long staple quality cottons in Sind, in the past, have not met with the success it was anticipated they would, the project, in the opinion of the Committee, nevertheless has possibilities which are well worth investigating. Accordingly, a five-year scheme for cotton breeding investigations for the production of long staple cottons for cultivation in Sind has been launched. The scheme came into operation in April 1940, and will be financed entirely by the Indian Central Cotton Committee, the Provincial Government providing the necessary land and buildings. With the approval of the Government of India, a sum of Rs. 2,01,690, spread over a period of 5 years, has been sanctioned for the scheme, and will be spent on the expert staff engaged, establishments and contingency charges (including purchase of necessary scientific apparatus and equipment). The experimental stations are situated at Mirpurkhas and Orderal. The most important problem to be tackled is to see whether high quality cottons, preferably of the 289F types, but possessing a better staple than *Sind Sudhar*, can be produced. The aim is to evolve a cotton longer than 1-1/16" which would spin about 60 counts and yield not less than 6 *minnds* of seed cotton per acre. The more important items in the programme of work are:—(1) Production of hybrids, using the back-cross technique, between cottons of 289F type and long staple cottons. (2) Testing of various selections from 289F. (Experience has shown that conditions for growth of cottons of 289F type are more favourable in Sind than in the Punjab). (3) Importation of fresh material from a wide range of places, such as, Egypt, Sudan, South Africa, U. S. A. and Brazil, etc., for acclimatization, selection and for providing material for hybridisation purposes. (4) Working out a system of cultivation best suited for long staple cottons.

(iii) PUNJAB.

(a) Punjab Botanical Scheme.—This is one of the earliest schemes of the Committee. Sanctioned in 1923, for a period of five years, it came into operation in August 1925, and has been extended from time to time, the last extension, which will expire on the 28th February 1945, being approved by the Committee at its meeting held in January 1940. Up to 31st March, 1936, the cost of the scheme was borne in full by the Committee, but since then, the expenditure is shared on a 50 : 50 basis between the Committee and the Provincial Government. The original object of the scheme was to investigate the causes of the periodic failures of American cotton in the Canal

Colonies of the Punjab where a large area is annually grown under such cottons and to obtain suitable types of American and *desi* cottons. In view, however, of the immediate economic importance of improved types of cotton, work was concentrated on breeding and a separate physiological scheme was sanctioned for investigating the problem of 1 ericlike failures of American cotton. The Botanical scheme has thus been concerned mainly with the improvement of both *desi* and American cottons. As more than half the cotton area in the Punjab lies in the Canal Colonies attention was first directed to the improvements of the cottons of that area. The South Western tract of the Province comprising the arid districts of Multan, Muzaffargarh and Dera Ghazi Khan were given attention next and a sub station for this purpose was opened at Multan in 1935. The first improved variety of American cotton to be given out for general distribution was 259 P/43 in 1934. The area under it during 1939-40 was estimated to be some 170 000 acres including Bahawalpur State. Amongst the *desi*, the first cotton to be evolved was 16 *Mollison* in 1929. This was replaced in 1930 by 15 *Mollison* which was in 1934 replaced by 39 *Mollison*. The latter is now the standard *desi* cotton of the Canal Colonies and the area under it during 1939-40 was estimated to be 435 000 acres. 39 *Mollison* is said to have gained so much popularity that the demand for its seed exceeded the supply. It is stated to give much better yield than the cottons originally grown in the Canal Colonies estimating the increased yield at even half a *manad* of *kapas* per acre at Rs 6 per *manad* (i.e. Rs 3 per acre) the additional income to the cultivators would amount to Rs 13 05 000. 119 *Kangunium* is another *desi* strain evolved under the scheme, the area under it during the past year was about 10 000 acres. A few other strains of both *desi* and American cottons have also been developed and are under trial at present.

Several strains of *Jubilee* cotton were tested during the year and some of them appeared to be good in respect of lint length and ginning output, special mention may be made of D C 17 which combines these characters with good yield. All the desirable characters have now been brought together in *Jubilee* cotton which is said to compare very favourably with the standard *Mollison*.

From the 83 American and 74 *desi* single plant progenies grown at Lyallpur a total of 5,146 plants was selected in the field and the elite amongst these have been retained for propagation in 1940-41. 13 F9 progenies from the cross, *Mollison* × *Million Dollar* were grown and further selections made. The cross, C B S (Barberson) × 289 P/43 has shown great possibilities in respect of lint length and ginning output which is about 34%.

Three families with average ginning percentage of 33.8 to 37.9% and halo length of 28.5 to 29.1 mm. have been bulked for preliminary trials. All the new desi and American strains were included in the preliminary varietal trials conducted at Misalwala and Multan sub-stations.

(b) Scheme for improvement of Punjab-American 289F/K25 Cotton.—This scheme was sanctioned in January 1938 for a period of five years and commenced work from the 9th July, 1938. The object of the scheme is the improvement of 289F/K. 25 cotton which was evolved at the B.C.G.A. Farm some years ago. Though this strain is said to be very popular in the Lower Bari Doab Canal Colony and the area under it has expanded very rapidly, it suffers from the defect of susceptibility to jassid attack. One of the aims of the present scheme, therefore, is to develop jassid-resistant strains from this cotton.

During the year under review, the crop in general suffered from *Thur*; the B.C.G.A. Farm, where this scheme is being carried out, is reported to have been particularly affected. The average yield amounting to only 3.65 *mands* per acre against 7.25 *mands* in 1938-39. The experimental plots also suffered badly; some of the breeding material has been lost while there is a shortage of viable seed in the rest. The varietal tests also did not give any reliable figures. The area under 289F/K. 25 was estimated to be in the neighbourhood of two lakhs of acres. Although the average ginning percentage of this variety is good, the limits of variation are still very wide. F₁ progenies of the following two crosses were grown in 1938:—

(a) 289F/K. 25. × 289F/43 and reciprocal.

(b) 289F/K. 25 × 47F and reciprocal.

From the 15 F₂ and the first back-cross families grown during the year, seed of hairy, high ginning plants have been selected for sowing in the ensuing year.

(c) Physiological Scheme.—Partial failures of the American cotton crop in the Punjab occurred in the years 1919 to 1921, 1926 to 1928, 1931 and 1932. The external symptoms of the cotton plants during these failures were early reddening and shedding of the leaves, premature opening of the bolls with immature seeds and low quality lint and, in extreme cases, the dwarfing of the plants. To account for these failures, various views were advanced, such as, the heat stroke theory (Alline, 1924), attack of White Fly (Roberts, 1929) and unfavourable combination of climatic and biotic factors (Trought, 1931). As, however, these theories could not be supported by sufficient data, it was thought that these failures were due to malnutrition of the plant and a

physiological scheme was accordingly started in March 1935, to study the physiology of the cotton plant with a view to determining, if possible, the nature of the nutritional disorder, the causes underlying it and the measures necessary to combat it. The scheme started work in 1935. In March 1937 it was decided to request the Empire Cotton Growing Corporation to loan the services of Dr. Maslon to inspect the scheme and give his views on it. In January 1938, it was decided that a soil survey on a large scale should be carried out to connect up soil conditions with cotton failure as recommended by Dr. Maslon. The scheme was due to terminate on the 14th March, 1940 but at its meeting held in August 1939 the Committee intimated an extension for a further period of about three years.

The work done so far has indicated that two sets of soil conditions are associated with the development of *Wral*, (1) soils with saline sub soils and (2) soils with nitrogen deficiency. These conditions may exist either separately in separate fields or together the intensity varying from field to field. Plants growing on soils of the first type are normal till July but later exhibit symptoms of drought. The recovery from wilting after each irrigation is of short duration. By the beginning of September, the leaves begin to shed there is also considerable shedding of flowers. The bolls are few they crack and are found to contain immature seeds. In soils of the second type the growth of the plant is luxuriant when the soil is light sandy loam. Stimulation symptoms appear at the bolling stage when the leaves turn yellow and red and are shed. The size of the new leaves is comparatively reduced. The number of bolls produced per plant is normal but they crack and contain immature seeds. In very heavy soils, containing alkali salts in the subsoil the growth though normal for a few weeks is later suppressed. The plants remain stunted and possess dark green leaves which show symptoms of drought. Premature defoliation of leaves and later *Wral* occurs. *Wral* is found to appear in its most serious form on sandy soils with all salts in the subsoil such soils are also deficient in nitrogen. The bolls are small in size and open badly. Tannins are produced in leaves with low nitrogen content. Their presence in the leaves which can now be easily detected by a simple method specially devised and known as the 'tannin test', can safely be regarded as an index of nitrogen starvation. If nitrogen in the form of sulphate of ammonia is applied to a crop when the test for tannins is given by the leaves it is found to recover within eight days after application and the appearance of *Wral* can be prevented. *Wral* on the first type of soil with the alkali salts cannot be ameliorated by the application of manures, which only results in vigorous growth.

Investigations of soil conditions where *Trvak* had appeared in the cotton crops in the years 1938-39 and 1939-40, in different cotton growing districts of the Punjab, have revealed that the same soil types found at Lyallpur are associated with *Trvak*, viz., (1) soils with saline subsoils and (2) soils with deficiency of nitrogen.

The 'tannin tests' were carried out during the year on the *zamindar's* fields in the month of August and sulphate of ammonia was immediately applied at the rate of two *mannds* per acre to those fields where the test was positive. Equal numbers of control plots were also kept in each field. The results of the experiments carried out in the 1939-40 season showed great increase in yields and improvement in opening, as compared with the yields and opening in the control plots. It was also found economically profitable to apply the fertilizer to such fields. Similar 'tannin tests' on a still larger scale have been carried out in the current cotton season of 1940-41, and, though, final results of yields are not yet available in most cases, the treated plots have already yielded more than the control plots. Late sowing of cotton is found to be a good ameliorative measure for *Trvak* on the second type of soil where there is salinity in the subsoil. Crops sown in the second or the third week of June are found to suffer much less from *Trvak* than crops sown in May which is at present the normal sowing time. The following observations have been made on the cotton crops sown early (May) and late (June) on such soils:—

(1) If the soil is highly saline within two feet of the soil surface, the late sown or the early sown crops are equally affected; the growth of plants is stunted and *Trvak* appears in both cases.

(2) If the soil is highly saline from the third or the fourth foot downwards, late sown crops suffer much less damage than the early sown under all conditions of weather.

(3) If the soil has medium to low salinity in the subsoil, the early sown plants suffer from *Trvak* if the weather conditions are unfavourable in September-October, while the late sown plants under similar conditions of soil and weather are found to suffer much less damage from *Trvak*.

(4) *Trvak* does not occur on normal (non-saline) lands under all conditions of weather if normal irrigations are given.

Amongst all the different varieties of cottons grown in the Punjab, the *deshi* cotton (*Mollisoni*) is found to be most resistant to salinity, though it

cannot be considered as immune. All varieties of Punjab American cottons suffer from *Arak* on soils with saline subsoils. As salinity in the subsoil is a common feature of the cotton soils in the Punjab where these cottons are grown all these varieties suffer from *Arak* and they show more *Arak* in a year of unfavourable weather conditions during the fruiting stage.

(d) **Root Rot Scheme**—This scheme which was sanctioned in 1932, is concerned with the investigation of root rot in the Punjab, where, particularly in the canal irrigated areas, the annual damage done to cotton by this disease is estimated at several lakhs of rupees. Both *desi* and American varieties are equally affected by the disease which makes its appearance towards the end of June and continues up to the middle of September. The organisms responsible for the disease are *R. bataticola* and *R. solani*.

During the year under review, experiments were conducted in different places with American and *desi* varieties to ascertain the effect of sowing date on the incidence of the disease and it was observed that the disease was markedly reduced in cotton sown after the middle of June and also in cottons sown in the first week of April. These data support the findings of the previous year. It was observed that there was a reduction in mortality in cotton when it is inter cropped with such crops as *bajra* and the lesser millets. Susceptibility of various varieties—37 Indian and 65 foreign—to root rot was ascertained by growing them on well infected soil. Only nine foreign varieties which showed a narrow range of mortality, i.e. 26 to 42 per cent, were selected for further trials. A number of fresh varieties were imported from various cotton growing countries for testing in the ensuing cotton season. One hundred and seventeen fresh selections have been made from the diseased plots for test next season. No definite indications regarding resistance of any type or selection to the disease, have so far been obtained.

(e) **Cotton Jassid Investigations in the Punjab**—This scheme was sanctioned in March 1937. The object of the scheme is the study of the jassid insect in the Punjab as regards its habits alternative host plants and characters of the cotton plant which determine resistance to the pest.

Observations made during the year on the incidence of the pest on the commercial varieties have once again revealed that 289H/K 25 is highly susceptible to jassid attack. Of the agronomic factors only the effect of late and early sowings on jassid attack was tested and it was found that late sown cotton was definitely more susceptible to the attack. The progeny *Tangris* X U4, which was found to be resistant to the pest in 1937, steadily lost its capacity for resistance and in 1939 actually succumbed to it. *Cambodia* cotton

is reported to have continued to flourish well under conditions of high infestation; its behaviour in future years will be watched. During the year, it was found that several species of jassids, other than *E. devastans*, *Distant* were common in certain parts of the Province. These have been identified as *E. Punjabensis*, *E. Binotala*, *E. Keri* and *E. Minor*.

Observations made on the number of eggs laid and their hatching on different varieties of cotton and *bhenli* showed that though the lowest number was laid on 39 *Mollisoni* and the highest on *bhenli*, the hatching percentage was practically the same in all cases. The results obtained during the last two years have shown that the young nymphs have no difficulty in feeding and developing into adults even on the most resistant cotton, but, in the year under review, a very high percentage of nymphs developed into adults on American cottons and *bhenli* and not on *desi* cottons. This is contrary to previous findings. It was observed that the quality of lint has considerably deteriorated as a result of jassid attack in the more susceptible types, like 38th, but not in the resistant types, like 28th/43.

The pest infested other plants like *bhenli* (*Hibiscus esculentus*), Potato (*Solanum tuberosum*), Brinjal (*Solanum melongina*), and Hollyhock (*Althea Rosei*) besides cotton. Early in the season, the proportion of *E. devastans* appeared to be very low on all the host plants, but as the season advanced, this percentage increased appreciably.

(i) **The Punjab Clean-up Scheme.**—This scheme was sanctioned in March 1937 and is the outcome of the Punjab Entomological Scheme which successfully terminated in March 1937. Its object is to deprive the Spotted Bollworm of its food during January-April in a compact area immediately after the last picking is over and to study the effect of this measure on the yield of *kupas*.

As in the previous year, a compact area of 500 square miles, comprising 183 villages in Lyallpur and Thang Districts, was selected for the removal of cotton stalks with *kudali* (a modification of *Lantana kudali* from Mysore). All other host plants were also carefully eradicated from this area.

The effect of the 'clean-up' measure on the Spotted Bollworm activity, during 1937-38 and 1938-39, on the succeeding cotton crops, both in the treated and the untreated areas, was studied and the results obtained are summarised below:—

(2) Cotton seedlings of both *desi* and American cottons in the cleaned area were practically free from the pest during the two years the campaign was in progress, the worm population on them varying

from nil to 2 per thousand seedlings. In the untreated area, on the other hand, infestation was considerable (particularly on the seedlings of *desi* cotton), the worm population varying from 11 to 20 and 1 to 4 per thousand seedlings of *desi* and American cottons respectively.

(ii) The Spotted Bollworm population in buds, flowers and bolls of *desi* and American cottons in the untreated area was more in 1938 and 1939 than in the cleaned area.

(iii) The number of open bolls damaged by Spotted Bollworms in the untreated area was about 4 times higher in 1938 and 5 times higher in 1939 than in the cleaned area.

(iv) The number of open bolls picked from plants grown free from Spotted Bollworm by night caging, both in the treated and untreated areas, during 1938-39, was almost equal but there were 6 bolls per plant more on the control plants in the case of the former area than on the control plants in the latter area.

(v) The increased yield of *desi* kapas per acre in the cleaned area was 20% per acre, while in the case of American cottons in the cleaned area it was 21.5% per acre.

(vi) The quantity of damaged loculi ("Kam Phuli") in the uncleaned area was double that in the cleaned area both during 1938 and 1939.

(iv) CENTRAL PROVINCES AND BERAH

(a) Scheme for Investigation of *Heliothis obsoleta* as a pest of cotton in the Central Provinces and Berar.—This scheme was sanctioned by the Committee in January 1938 for a period of one year and came into operation on the 25th June, 1939. The objects of the schemes were (1) to ascertain (a) whether *Heliothis obsoleta* attacking cotton in the Central Provinces and Berar is the common gram caterpillar which attacks gram and various other crops or a special biological race of the species which attacks cotton in particular and (b) whether it is identical with *Heliothis obsoleta* which is the American bollworm of cotton, (2) to determine its economic status and whether it is likely to prove a serious pest of cotton in the Central Provinces and Berar. The results obtained under the scheme are summarised below.

Observations made at Akola show that *Heliothis obsoleta* makes its appearance on cotton in July and continues to remain on this crop till November.

It prefers the exotic variety *Buri* to other varieties such as *Vernam* and *Tari*. During 1939-40 season, it caused slight damage to *Buri*, but in 1940-41, its incidence was observed to be extremely low and stray caterpillars could be found with difficulty. At other places also such as Basim, Bargaon and Ellichpur, the incidence of the pest was low. As regards its seasonal history, the caterpillars are found on *tur* from November and persist till January. In December, however, they concentrate on gram which becomes heavily infested and suffers substantial damage. The caterpillars are also found on other crops such as groundnut, pea, tobacco, tomato, cabbage, and safflower. From March till June, though regular search was made on available alternative food plants on the Akola farm, not a single larva was found. One or two larvae on some vegetable crops were found in July-August.

The moths bred from various food plants were sent to the Imperial Agricultural Research Institute, New Delhi, for examination; as a result of which two points are definitely established, (i) that *Heliothis obsoleta* found on cotton is identical with that found on gram and various other food plants in India and (ii) that it is also identical with *Heliothis obsoleta* which is the American bollworm of cotton.

As regards the economic status of the pest, since the general incidence of the bollworms was extremely low, the conclusion based on observations of 1939-40 that *Heliothis obsoleta* is not a serious pest of cotton is more or less tentative nature. It can, however, be safely stated that, at the present stage, it does not threaten to be a serious pest of cotton.

(b) Central Provinces and Berar Cotton Breeding Scheme.—The Central

Provinces and Berar Cotton Breeding Scheme was sanctioned by the Committee for a period of five years with effect from the 1st April, 1939, and re-placed the Central Provinces Botanical Scheme which terminated on the 31st March, 1939. The object of this scheme is to evolve, by selection or hybridisation, suitable new strains of cotton which can compete successfully with the local *Omras* in point of ginning outturn and yield and which, at the same time, possess a staple capable of spinning between 20s to 25s highest standard warp counts. The scheme is worked at Nagpur and at Akola, to suit the special requirements of the Central Provinces and Berar respectively. The work done during the year is described below under 'Central Provinces Cotton Breeding Scheme' and 'Berar Cotton Breeding Scheme'.

The Central Provinces Cotton Breeding Scheme is concerned with the breeding of improved strains of cotton suitable for Nagpur, Wardha, Chanda and parts of Chhindwara districts and capable of replacing the ordinary short

staple mixed cotton of these areas. The yield trials conducted during the year under review on the Government Farm and on cultivators' fields are reported to have brought out once more the superiority of V 434 over all other types of cotton grown. The yield obtained from it was 961 lbs per acre and it has now established itself as being the best cotton for the tract.

432 selections from *Vernum*, *Malhensis*, *Bani*, *Bishnoor*, *Bani* × *Cernuum* and *Buri* × *Lone Star* were tested for purity, and several strains of *Vernum*, *Malhensis* and *Local Jari*, combining high ginning quality (32 to 36%) with good yield, have been selected for trial in the ensuing season. Twenty of the most promising strains from the cross *Bani* × *Lone Star*, possessing a staple length of 1" to 1½" with a ginning percentage of 30 to 37, have been selected for further study. The new strains, H 413, H 414 and H 420, obtained from the cross *Bani* × *Cernuum*, are reported to be promising.

The Cotton Breeding Scheme at Akola is concerned with the production of high yielding superior strains of cotton suitable for the Berars and possessing a staple of at least ¾", with the softness, colour and strength of V. 434 and a ginning percentage of above 33. Breeding of high ginning new strains of *buri* cotton for the Burhanpur *tahsil* also forms part of this scheme. Out of 260 single lines, grown from seeds obtained from Nagpur and the Akola farm, 82 were from *Buri* selections and 178 from *deshi* cottons. 8,299 plants were under observation and study, systematic notes were taken and records kept of their behaviour in the field from the time of germination to the time of picking. In the field, notes were taken on germination vigour, resistance, or susceptibility to diseases, late or early maturity, character of bearing, shed ding tendency, colour of flower, number of vegetative branches, bursting of boll, etc. Each selected plant was picked separately after examining the staple, feel, strength, etc. Out of 8,299 single plants, 2,718 were selected in the field and examined in the laboratory, no less than 80 per cent of the plants gave an yield which was above normal and about 75% had a staple length above ¾". In ginning percentages, however, they fell off badly, giving only 9.25 per cent desirable plants. In addition to the number of plants selected from these, about 1,200 primary single plant selections were made, mostly from ryots' fields. Some selections were also made in V 434, *H* strains and *Buri*. Laboratory examination of individual plant produce has indicated that this new material offers good chance for the isolation of more promising plants which will conform to the desired standard. Out of this collection 539 plants have been finally selected for propagation and study during the ensuing season. There will thus be 968 single line cultures for study next year.

A study of the Root system of the above mentioned four cotton strains was also carried out at different stages of their growth in order to find out differences, if any, and to correlate these with varietal differences. A comparison of the mounted specimens of these showed a stronger development of the laterals in V 434 than in others.

(v) MADRAS

(a) *Pempheres* Scheme.—In parts of Madras where *Cambodia* cotton is grown over large areas, healthy plants wither away all of a sudden due to damage caused by the cotton stem weevil. In seasons when the incidence of the pest is severe, the loss by death of plants may be as great as 25%. With the object of finding out ways and means of controlling and reducing this loss, the Committee in 1925 sanctioned the *Pempheres* and Physiological Scheme, which, however, owing to the difficulty of securing a competent plant physiologist, had to remain in abeyance. In 1931, however, it was decided to send for training in England two officers selected from the Madras Agricultural Department with a view to their eventually occupying the posts of physiological botanist and biochemist under the scheme. In the meanwhile, preliminary investigations were started under the direction of the Cotton Specialist, Combaratore.

The scheme, as originally sanctioned, consisted of two investigations, one for the control of cotton stem weevil (*Pempheres affinis*) and the other for the evolution of a strain in *Karunganni* cotton resistant to the harmful effects of February rains. The first problem was pursued in three directions, botanical, bio chemical and entomological. On the botanical side, the aim was to evolve a strain which would not allow the insect time to complete its life cycle inside the stem. On the bio chemical side, the causes that made strains susceptible to the insect and the factors that helped the plants to resist its attack more efficiently were investigated. On the entomological side efforts were concentrated to survey the distribution of the insect and to explore the possibility of checking its spread by biological methods.

In July 1938, the working of the scheme was reviewed and, as it was felt that the possibilities of biological control were doubtful and that bio chemical research was also not likely to lead to any successful results, it was decided that these two sections of the work should be closed down with effect from the 31st October, 1938, and 31st August, 1939, respectively. It was further decided that the physiological investigations should also be terminated from 1st November, 1938, as the experimental work in this connection had been brought to a stage when further investigation could be continued by the Agricultural

Department itself. The botanical research was, however, extended upto October 1941 and it is with this that the work done during the past year was concerned.

During the year under review, the severity of weevil attack was unusually high at Coimbatore; *Co. 2* recorded 58% mortality against 28% in the previous year. As the plant reaction to insect infestation at Coimbatore and Srivilliputhur varied owing to the climatic differences, the criteria used in the selection of cultures at the two places differed. In the comparative trials at Srivilliputhur, only three sibs of 4413 (*Bourbon* \times *Co. 2* cross) gave significantly higher yields than the control. 7176/6—a resistant *Moco* culture—yielded as much as the control. In a similar trial at Coimbatore, 7178/7 and 7176/5C—derivatives of *Moco* \times *Co. 2* cross—were on par with the control in respect of yield but far superior to it in the degree of resistance. The sibs of 4413 have proved to be distinctly more productive even at Coimbatore, but they did not show the desired degree of resistance. Out of 222 progeny rows at Srivilliputhur, only three recorded low mortality and adult emergence. At Coimbatore, where 716 cultures were under trial, 19 cultures, 17 of which were derivatives of *Moco* \times *Co. 2* cross, proved to be resistant and high yielding. 6142 was found to combine all the desirable characters, except boll size. Periodical examination of the resistant strain—7178/7—and the susceptible type—*Co. 2*—was carried out and the former strain with its capacity to gum the infestations from the early stages, was found to be distinctly more efficient in resisting the weevil attack than the susceptible type *Co. 2*.

(b) Scheme for improvement of Mungari cotton in Madras Province.—This scheme was sanctioned by the Committee in 1937 and has for its object the evolution of strains suitable to the red soils and combining the quality of the *Westerns* with the yield of *Mungari*, to replace the inferior *Mungari*, the existence of which affords opportunities for mixing, with the result that the better cottons of the tract fail to get their proper value. On the black soils of Anantapur, Bellary and Kurnool districts of the Madras Presidency, cottons commercially known as *Westerns* and *Northerns* are grown. These are medium staple varieties, capable of spinning 24s to 32s. The type of cotton grown on the red and mixed soils, on the other hand, is that known by the name of *Mungari*, which is a coarse short staple variety, similar to Bengals, and not fit to spin more than 8s or 10s. The co-existence of these widely different varieties in the same tract favours undesirable mixing with the result that the better cottons suffer in value. It is to overcome this difficulty that the *Mungari* scheme was started.

During the year under report, *V* 434 and Σ 4383 were again found to be satisfactory and, but for its low ginning and susceptibility to 'stenosis,' *V* 434 would have been considered a good substitute for the local *Mungara*. The strain, Σ 4383, though free from these defects, is highly susceptible to thrips. Further trials are necessary before a final choice for the tract can be made. Of the 345 cultures under progeny row trials, 252 were picked and compared with the local, of these, 6 were found to be superior and 52 equal to the control in respect of yield. The handling of the breeding material was reported to have been handicapped by the heavy damage caused by the groundnut red hairy caterpillar and the occurrence, on a large scale of the small leaf disease—'stenosis'—in all the country cottons.

(c) **Madras Nadam Cotton Breeding Scheme**—This scheme was sanctioned in 1933 with the object of securing one or two suitable annual types of cottons capable of replacing *Nadam* (*G. arboreum* var *typicum* forma *indica*), a perennial variety, in the red soil areas of Salem and Coimbatore districts where, due to poor soil and precarious rainfall, neither *Karunganni* (*G. arboreum* var *neglectum*) nor *Uppam* (*G. herbaceum* var *frutescens*) can be satisfactorily grown. *Nadam*, being a perennial variety, serves as a breeding ground for pests like the stem weevil and pink bollworm during the close period of *Cam bodu* prescribed under the Madras Pest Act. The object is sought to be achieved either by crossing *Nadam* with annual types or by the introduction of suitable early growing varieties.

Though the rainfall of 33.01" during the year was far in excess of the average, its unfavourable distribution proved harmful to cotton. 432 cultures (294 of American and 138 of Asiatic types) were tested in replicated progeny rows using *Co 2* and *K1* as control. Only 7 cultures of American crosses were found to be superior to *Co 2* in respect of yield. In the case of the Asiatic types, none was better than *K1*. Another yield test revealed that, while in the American series none of the strains was better than *K1*, in the Asiatic Series, strain 6145 gave significantly better yield than the control. In the perennial cotton series, *K1* was found to be the best.

Attempts made to isolate early maturing and productive types in *Nadam* variety by simple selection have not proved successful and the introduced and hybridised material does not contain the desired combinations of characters. It is, therefore, proposed to terminate the scheme in 1941.

(d) **Scheme for Improvement of Cocanadas Cotton in Madras Province.**—This scheme was sanctioned by the Committee in November 1938 for a period of five years and commenced work from the 1st February, 1940. The object

of the scheme is to improve the yield and ginning percentage of *Cocanadas* cotton, preserving, at the same time, the light pinkish colour of its lint, owing to which, it is in great demand for the manufacture of dyed yarns.

During the period under review, the cotton areas of Nellore, Guntur and Krishna Districts were surveyed and samples of 642 single plants and 53 bulk lots were collected. The survey has revealed that on shallow red and light black soils the crop is sown early, while, on the deep black soils, late sowing is the rule. Arrangements have been made to sow the collected material on both types of soils.

(e) Scheme for investigating the possibilities of control of Cotton Stem Weevil of South India.—This scheme was sanctioned in November 1938, for a period of one year, for investigating the possibilities of control of the cotton stem weevil of South India by means of its natural enemies.

During the year under report, the presence of the cotton stem weevil was noted in all cottons grown in the Salem district and in several alternate host plants in North Arcot and the Malabar districts. The infestation, which commenced in October, gradually increased and reached its height late in February or early March. Thereafter, there was a decline. 5,279 alternate host plants, composed of 14 species belonging to 7 genera, have been examined for infestation. Two of the species have been classed as doubtful hosts and two as new hosts. The study of the biology and distribution of the parasites was continued and two new parasites were observed during the year. It was found that the highest percentage of parasitism in cotton was only 0.83 compared with 13.9%, 2.08% and 2.6% noted in *Triumphetta rhomboides*, *Hibiscus vitifolius*, and *Pavonia Zeylanica*, respectively.

(vi) UNITED PROVINCES.

The United Provinces Botanical Scheme.—This scheme was sanctioned by the Committee in January 1938 for a period of five years and was put into operation in August 1938. It is concerned with the development of improved strains of Bengals cottons for the rain-fed and irrigated tracts of the United Provinces from the material collected in the course of the recent survey of cottons conducted in Rohilkhand and Bundelkhand and the investigation of the possibilities of growing long staple cottons in the Pink Boll worm controlled areas. Concurrently, the suitability of the United Provinces improved cottons—*C. 402*, *C. 520* and *Perso-American*—against local and other promising introductions is being tested, both on Government farms and on cultivators' fields.

The crop during the year under review, suffered for want of rain in August and from heavy rain and strong winds in September in a number of districts. Detailed examination, purification and replicated tests of the material derived from the original 27 000 single plant collections were carried out at each of the four research stations located in the four cotton growing tracts of the Province. The promising selections from the 1933-34 and 1935 material were tested against the existing improved types, *C. 520* and *C. 402*. The progenies of 17 selections from the 1937 material, did not give significantly higher yields than *C. 520*, a few strains were, however, selected for testing in the ensuing year. From the crop of 1938, only 20 selections that satisfied the standards of yield, staple, etc., have been carried forward for study in replicated progeny row trials. The trials of *C. 402* and *C. 520* have indicated the possibility of getting some better material than the existing bulks. In the trials of fresh introductions of *desi* types, viz., *Mollisoni 116*, *M. 52* and *Sanguineum 119*, against *C. 520* *M. 116* showed its superiority in respect of yield in two places but the difference was not significant. Amongst the Americans, none fared better than the *Pero American*.

The established strains were tested extensively both on Government Farms and on cultivators' fields under irrigated and dry conditions. A study of the results on Government farms under dry conditions revealed the general superiority of survey types 'D', 'A' and *C. 520* over types 'L' and *C. 402*. Spacing experiments are reported to have shown that closer spacing tends to produce better yields under irrigated conditions. In view of the encouraging performance of *Pero American* during the last few years, it was tested on a large scale during the year under report. It was sown over an area of 140 acres in Ujharu (Badami) and is stated to have given an increased income of Rs 1,800 to the farmers. *C. 520*, an improved *desi* strain, is reported to be gaining in popularity, owing to its general superiority over the local growths. The area under it rose from 29 000 acres to 34,449 acres in the past year.

(iii) BENGAL

Comilla Cotton Scheme.—This scheme was sanctioned in February 1933 and came into operation in December 1934. It is concerned with the improvement of the commercial characters of *cernuum* cotton by the isolation of a coarse, high ginning and good yielding strain, suitable for mixing with wool.

During the year under report, 23 strains were under trial for yield and ginning percentage. There were also 490 single lines under observation.

some of which appeared to be very promising. 12 bulks were formed from the lines of replicated progeny rows of 1938-39 for seed multiplication. These were sown in the *jhum*. One of these proved to be a good yielder with a ginning percentage of 42.5. The coarseness of fibre was equal to that of Garow Hill cotton. Of the 22 bulks formed from the trials of survey, Nos. 14 and 19 are worthy of mixture, both being good ginners, hardy and capable of giving good yield. Their lint, however, is slightly less rough.

(viii) BALUCHISTAN.

Scheme for control of Black-headed Cricket in Baluchistan.—This scheme was sanctioned in August 1939 for a period of two years to run concurrently and in co-ordination with the scheme for investigation into the Black-headed Cricket in Sind sanctioned by the Committee in January 1938. The object of the scheme is to find out measures which will be effective in controlling the pest in the early stages of the growth of the cotton plant when it is said to cause a great deal of damage. It is reported that the pest, which is of a nocturnal type with a migratory habit, can be controlled by means of barriers and baits placed in its way. As a result of the measures adopted, infestation was reduced to hardly 5% in the Usta *tehsil*. The control measures would have been more successful had they been undertaken early in April.

(ix) HYDERABAD.

(a) **Botanical Research Scheme**—Hyderabad is the third biggest cotton growing territory in India and some years back it had the reputation of producing one of the finest indigenous cottons, *viz.*, *Gaorani* or *Bani*. This long staple variety, however, suffered from the defect of being a low ginner with the result that it has now been largely replaced by high ginning short staple *neglectums*. In 1929, the Committee, realising the importance of this large cotton tract, sanctioned a botanical research scheme known as the Hyderabad Botanical Research Scheme, Parbhani, the object of which is to study the several varieties of cotton grown in Hyderabad and to secure from them, high ginning medium staple types, to replace the existing varieties in the different parts of the State. A large number of improved pure strains has been evolved under the scheme, amongst which *Gaorani 6* is the most outstanding.

During the period under review, preliminary tests on 624 new selections of medium and short staple *Gaorani* were carried out at Parbhani, Latur and Madhol. *Gaorani 4B-5* and the local variety of Parbhani were used as control.

50 progenies were selected, on the basis of yield and other characters, for inclusion in comparative tests next season. About 1500 plants picked from the cultivators' fields in the *Gaorani Protected Area* and from the plants grown at Parbhani and Latur were examined and 350 of these were reserved for further study.

The varietal tests conducted at Parbhani and Madhol with other four strains, viz., *G 4B 5*, *G 6*, *G 6E 3* and *G 115*, using *Gaorani Umri* as control at both the places showed that *G 115* is definitely superior in respect of yield. In the trial at Latur where *G 6* and *G 115* were substituted by *G 3B 1* and *G 123* and where Latur *Gaorani* was used as the control *G 3B 1* gave the highest yield but it had a slightly coarse fibre. In the second set of varietal trials at the Experimental Farm and the Research Station Parbhani, 4 strains—*G 16C*, *PB 703G 2*, *G 12 F* and *PB 26D 4* were tested against *Gaorani Umri*. Judging from the yield figures and the economic characters, *G 16C* is the most promising of the improved strains. Its lint was adjudged suitable for 27's highest standard warp counts. In the comparative test on 24 medium staple strains against *Gaorani Umri*, conducted at the Cotton Research Station Parbhani 22 strains were found to be better in respect of yield and fibre length than *Gaorani Umri* and 4 of these—*Gaorani 115*, *Gaorani 126*, *Gaorani 149* and *Gaorani 130*—excelled it by about 50%. Another comparative test with 14 *Gaorani* strains was conducted at the Plant Breeding Station, Latur against the local *Gaorani*. In this *16C* gave the highest yield and the differences between it and all the other strains were significant. *P B American 2* was the only strain that gave a significantly lower yield than the local variety. A similar test with 13 strains and *Gaorani Umri* was conducted at Madhol, in this all the strains gave significantly higher yields than *Gaorani Umri* and three of them, viz., *Gaorani 58A 1*, *Gaorani 143* and *Gaorani 145*, excelled it by about 50%. All the improved strains possess longer fibre and higher ginning outturn than *Gaorani Umri*. The superiority of *Gaorani 16C* was confirmed in another experiment tried in the Parbhani district. In the study of resistance to wilt, 12 progenies recorded 0—3% mortality against 6% of *Gaorani 6*. A new strain, *Parbhani American* which was tried for 3 years in the hill areas of Aurangabad district, gave satisfactory results, it spins 30s highest standard warp counts against 6s to 10s of the parent bulk.

During the year, 4 182,546 lbs of *Gaorani 6* were distributed over an area of 2,32,300 acres. The total production of lint amounted to 40 000 bales i.e., an average yield of nearly 215 lbs of *Lapas* per acre. The entire produce was ginned, pressed and sold under State supervision and it was

estimated that the growers of *Gaorani 6* realised Rs. 6,00,000 more on account of the superior quality of the strain alone. Nearly 5,250,000 lbs. of pure seed were purchased by the Department of Agriculture for distribution in the current season in a compact block of about 3,30,000 acres. The natural spread is estimated to occupy about 40,000 acres.

(b) **Pink and Spotted Bollworm Scheme.**—This scheme was started in January 1933 with the object of determining (1) the actual amount of damage done by the Pink and Spotted Bollworms to the cotton crop in the Godavary Valley, (2) the progress of their attack on the growing crop in the season, (3) the mode of their carry-over from one season to another and (4) the effect of the likely control measures. The scheme closed down in May 1940.

The investigations on the Pink and Spotted Bollworms in the Hyderabad State have shown that the damage by the former is more in the early pickings, whilst the Spotted Bollworm does more damage in the later pickings. The bolls affected by the bollworms are commonly observed to open prematurely. Though a number of alternative host plants were found to harbour the Pink Bollworm, the possibility of carry-over through them is considered remote as all of them dried up before March. The summer-sown *bhendi*, however, permits the continuous breeding of the pest. The stand-over cotton plants and their sprouts also serve as suitable media for the breeding of the pest during the off-season. Examination of the soil during the off-season, March-June, showed the presence of the Pink Bollworm caterpillars upto a depth of 18 feet. The early ripening varieties, like *Gaorani 6*, escape bollworm damage to a great extent while the American types suffer the most.

The study of the different problems has revealed that the prevention of the carry-over of the pests from one season to the other is the only measure of control that can be adopted against the bollworms and the operations suggested for an effective prevention of the carry-over are :—

1. Growing of early maturing types,
2. Early harvesting of cotton,
3. Removal of all cottons and cultivated and wild alternative host plants,
4. Prevention of the cultivation of *bhendi* and *ambadi*,
5. Ginning of all *kapas* before the end of April, and
6. Controlling the import of seed or seed cotton known to be infested by Pink Bollworm.

(c) **Hyderabad Bollworm Clean-up Scheme.**—This scheme, which is the outcome of the investigation conducted on the bollworms of cotton during the years 1931-37, was sanctioned in August 1936, but, owing to administrative difficulties, it could not be put into operation before the 1st October, 1937. The object of the scheme is to demonstrate the efficacy and practical value of the following control measures against the Pink and Spotted bollworms in a compact area of about 400 square miles in Nanded district —

- 1 Removal of cotton plants as soon after the final picking as possible,
- 2 Completion of ginning of all seed cotton before the 1st May of each year,
- 3 Removal of alternative host plants and prohibition of cultivation of *bhendi* and *ambadi* in the off season

The research carried out at Parbhani has shown that the Pink and Spotted Bollworms are together responsible for a loss of 25 to 33 per cent of the annual crop, the newly developed, early maturing strains of *Gaorani* suffering markedly less than the existing commercial variety. The Spotted Bollworm passes from one cotton crop to the next by continuing to breed either on cotton plants left standing in the fields after the final picking, or on alternate host plants of *bhendi* (*Hibiscus esculentus*) and *ambadi* (*Hibiscus cannabinus*) grown as garden crops during this period. The Pink Bollworm either remains active on the standing cotton plants till the first week of May or goes into hibernation from October onwards. It has been found also that unlike the case in the United Provinces, the Punjab and Egypt, very few larvae of Pink Bollworm hibernate in seed. Most of the hibernating larvae exist either amongst the fibres of *kapas* or in the cracks that are so characteristic of black cotton soils after the end of the rainy season.

The following items were studied during the year under report —

- (1) Incidence of bollworms on the new crop of cleaned and untreated, and early and late cleaned, areas
- (2) Analysis of the ripe crop of the same tracts for damage by bollworms
- (3) Complete clean up of cotton fields in the Control Area
- (4) Prevention of growing of *bhendi* and *ambadi* in the off season and
- (5) Completion of the ginning of all *kapas* before 30th April, 1939

Due to the low carry over of Pink Bollworm from 1938-39 and the abnormally early maturation of the new crop, the attack of the pests on the 1939-40

crop was low, both in the treated and untreated areas. However, the differences between these areas in respect of the initial as well as subsequent attack (more specially of the Spotted Bollworm) were fairly clear. The effects of early and late cleaning of *Gaorani 6* on the incidence of bollworms on the new crop were masked by the effects of differences in the nature and fertility of the soil of the tracts so treated. The soil examination of early and late cleaned areas in 1939 had indicated a smaller aestivation of Pink Bollworm in the early cleaned plots. Similar examination of soil in 1940 failed to reveal any such difference. This is ascribed to the abnormally early maturation of the 1939-40 crop and the extremely dry weather from October 1939 onwards. The analysis of ripe crop of early and late cleaned areas also gave more or less similar results.

The clean-up work was carried out successfully for the third season. In much of the area, the clearance of fields was completed by 15th March, i.e., six weeks earlier than in the previous year. An area of about fifty square miles, growing *Gaorani 6*, was cleaned much later in the season, in order to compare the effects of early and late cleaning on the incidence of bollworms on the succeeding crop. Financial and physical difficulties, coupled with the aversion of the annual tenants to clean their leased lands, were found to be the greatest hindrances in the early clean-up of cotton fields. The ginning of all the *kapas* in the treated area was completed before 30th of April and the growing of the alternative host plants, *bhendi* and *ambadi*, in the off-season was successfully prevented. However, none of the vegetables suggested as substitutes for *bhendi* and *ambadi* during the off-season was found to gain popularity with the cultivators.

(d) **Scheme for inclusion of Northern and Western Cottons in Programme of work of Dry Farming Scheme at Raichur.**—This scheme, which was sanctioned in March 1937 and renewed in July 1938, has a two-fold object, viz., (1) to consider the possibility of growing medium and long staple cotton in short staple areas in India, and (2) to find out how far the devising of dry farming methods would go hand in hand with the successful growing of such cottons in the dry and low rainfall tracts of the country.

The work during the year under review was carried out on the same lines as in the previous year with the necessary modifications suggested by the Committee. The following four experiments were under study :—

1. Manurial cum varietal experiment,
2. Tillage experiment,
3. Bunding experiment, and
4. Observations to test the superiority of varieties.

while Nos. 2 and 3 were good in respect of lint length only. The bulk test with the above ten types and five other promising selections confirmed the high yielding capacity of Nos. 9 and 10 and also showed that No. 15 is even better than the other two in yield. Six varieties—*N.R.*, *C. 520*, *Jarila*, *Banilla*, *V. 434* and *V. 438*—were tested in replicated plots against the local *Mathio*; *N.R.* responded best with a yield of 472 lbs. per acre while *C. 520* and *Mathio* closely followed with 463 and 460 lbs, respectively. All these, however, were poor in respect of staple and spinning quality. *C. 520* and *Banilla* gave a ginning percentage of 34 and 35, respectively, the others being lower. *C. 520* is in addition an early maturing type. The consistent better performance of *C. 520* during the last three years prompted the undertaking of trials on a large scale on the cultivators' fields. The other varieties suffered from more than one defect and were found unsuitable to the tract.

(xi) BIKANER.

Bengals Cotton Improvement Scheme.—The opening of the Gang Canal under the Sutlej Valley Scheme resulted in the colonization of a new and virgin area, known as the Gang Canal area, with immigrant peasants, mostly from the Punjab, who were accustomed to the cultivation of the Punjab *desi* and American types of cotton. These cultivators found it difficult to successfully cultivate cotton under local conditions, evidently because the new environment was not quite the same as they were accustomed to in the Punjab. It was even feared that the area under cotton would be seriously reduced. This scheme, was therefore, started in January 1931, for the purpose of studying the local problems of the agriculturists and for obtaining by selection and hybridisation one or more superior types of cotton suitable to the locality. Until 1934, the botanical work was confined to the testing out of a large number of outside varieties both *desi* and American. After that year, however, extensive survey of the Rajputana tract was undertaken to collect breeding material; at the same time, extensive trials of the few selected cottons from outside were continued to test their suitability to the tract. Agronomic work was pursued intensively from the beginning of the scheme. At the end of the first five years, it was found that *C. 520* was the most profitable cotton to grow in the tract and the American cottons were generally unsuitable because of their low yield and susceptibility to disease. Also the staple of Punjab-American cottons was found to deteriorate both in length and strength when grown under Ganganagar conditions. A large amount of data and useful information regarding sowing times, seed rate, frequency and distribution of irrigation, optimum spacing for the *desi* and American cottons, rotation and manuring have been collected.

During the year under review, *K.S.* progenies from the last year's material were tested for root rot resistance in a glass-house. Crops like *bajri*, rice, *sann* hemp, *variati*, *tur*, which are usually sown mixed with cotton were rotated with the latter and also sown in alternate rows with cotton to study their protective effect on the disease. The results indicated that intercropping with *sann* or *bajri* significantly reduced the mortality of the cotton crop. Twelve of the best *K.S.* families were selected and replicated five times but no significant differences in yields between the families were found. The best plants, showing higher resistance, good yield and other economic characters, have been selected for inclusion in the next year's trials. Sixty of the best *karkhadi* plants, including new selections, were grown in a progeny row trial and the differences between progenies were significant both in respect of mortality and yield. The high yielding capacity of *karkhadi* families, in comparison with *Broach 9*, was also brought out in the bulk trials. Spinning performance of the eleven families tested at the Technological Laboratory gave about 10's against 24's of *Broach 9* and it is proposed to effect an improvement in quality by hybridizing the most favourable *karkhadi* strains with quality cottons like *1027 A.L.F.*, *Verum*, *Jarila* and *Gaorani*. Further selection in *karkhadi* would be confined to plants with greater root rot resistance.

(b) **Plant Puller Propaganda Scheme.**—This scheme, which aims at the eradication of the Spotted Bollworm by the uprooting of cotton stalks by the use of the plant puller, was sanctioned in August 1934 and came into operation on the 1st January, 1936.

During the year under report, the number of plant pullers sold in the Baroda District and the Navsari District was 4,831 and 1,980, respectively, and the area handled amounted to 167,612 acres and 178,594 *bighas*, respectively. The percentage of the uprooted area was 72 in the Navsari District against 84.05 in the Baroda District.

(c) **Scheme for improvement of Mathio Cotton at Amreli.**—This scheme, which was sanctioned in August 1936 for five years and put into operation on the 1st June, 1937, has for its object the improvement of *Mathio* mixture in respect of yield, ginning percentage and quality and the trial at Amreli of the early strains of *Wagad* evolved at Viramgam with a view to replacing, if possible, inferior *Mathio* by early *herbaceums*.

During the year under review, the 10 *Mathio* selections, with 33%—37% ginning capacity and 0.72" to 0.79" staple, were grown in replicated rows. Selections 9 and 10 maintained their high yielding capacity for the second year. Nos. 5 and 6 were superior in ginning (36%) as well as spinning (21s—22s)

while Nos. 2 and 3 were good in respect of lint length only. The bulk test with the above ten types and five other promising selections confirmed the high-yielding capacity of Nos. 9 and 10 and also showed that No. 15 is even better than the other two in yield. Six varieties—*N.R.*, *C. 520*, *Jarila*, *Banilla*, *V. 434* and *V. 438*—were tested in replicated plots against the local *Mathio*; *N.R.* responded best with a yield of 472 lbs. per acre while *C. 520* and *Mathio* closely followed with 463 and 460 lbs., respectively. All these, however, were poor in respect of staple and spinning quality. *C. 520* and *Banilla* gave a ginning percentage of 34 and 35, respectively, the others being lower. *C. 520* is in addition an early maturing type. The consistent better performance of *C. 520* during the last three years prompted the undertaking of trials on a large scale on the cultivators' fields. The other varieties suffered from more than one defect and were found unsuitable to the tract.

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Since 1934, greater attention has been paid to selection and breeding problems ; the results obtained so far are summarised below :—

- (1) Re-selection in *C. 520* has yielded strains which show much better germination possibly also a little higher yield than *C. 520*.
- (2) Some of the local selections have proved better yielders than *C. 520*, but are poorer in quality.
- (3) It appears doubtful whether mere selection would improve the quality of the *desi* cotton.
- (4) Breeding tests have shown that there are possibilities of improving the quality by hybridization. As regards cottons that may be used as parents, the set *C. 520* × *Bani* appears to offer the best chances of achieving the desired results.
- (5) For the last two years *P.A. 289F* has done as well as *C. 520* but it suffers from immaturity of the seed.
- (6) In a variety *cum* agronomy experiment, interesting results have been obtained which show that the *desi* cotton (*C. 520*) can respond as well as the American to more favourable conditions—liberal watering and manuring, etc.

During the year under review, special attention has been paid to ensure, as far as possible, a good initial stand, by avoiding bad germination on account of defective seed. Selections from within *C. 520* did not prove to be better than the parent type. One selection from the Rohilkhand survey material, *viz.*, *R. 18*, was distinctly better than *C. 520* in yield and ginning percentage. Testing of the material of the cross—*C. 520* × *bani*—had to be abandoned, owing to very poor germination and high incidence of *Tirak*. The varietal experiments, in which 3 American and 5 *desi* cottons were compared with *C. 520*, showed that the final stand expressed as percentage of stand at thinning varied between 47-57 in American and between 41-73 in *desis*. *Sanguineum 119* gave the highest stand, while *R. 18* gave the lowest. *R. 18*, however, with its productivity, high ginning and a staple equal to that of *C. 520* is expected to bring greater monetary return to the cultivator than *C. 520*.

The result of manurial experiments for the last three years have shown that manuring has not only no effect on yield, but it tends to decrease the stand by encouraging white ant attack. Heavy irrigation, however, conserves the stand and increases the yields. There is no evidence that the American varieties differ from the *desi* types in their response to either of the treatments—manuring and irrigation.

(xii) MYSORE,

Mysore (Doddahathi) Cotton Scheme.—This scheme was sanctioned in February 1935 and came into operation in November 1935. It is concerned with the breeding, from the local *Doddahathi* or American cotton, of suitable types, resistant to "red leaf" disease which stands in the way of the expansion of this crop in the Irwin Canal area in Mysore State.

Of the 12 selections tested during the year in replicated randomised layouts, all except $\times 4383$, *M.A. II*, $\times 3915$ and *Co 1267* gave poor yields; their germination, vigour, boll shedding, flower and boll production indicated that the Indian *hirsutums* particularly *M.A. II*, $\times 4383$, $\times 3915$ and *Co 1267* are more vigorous than the African *hirsutums* or *barbadense*. Plantings done during February-July produced a higher number of bolls than those done during August-December. The highest yield was recorded from March planting. The four varieties referred to above proved to be the best in respect of yield of seed cotton per acre in all the sowings. The incidence of the 'red leaf' disease varied according to season but these four varieties were the least affected; the African *hirsutums*, *Punjab American* cotton and *Gadag No. 1* suffered the most.

The manurial trials indicated that higher doses of nitrogen given at different periods of plant growth produce a greater number of healthy plants.

Selections were made in *M.A. II*, *Co 2*, *289F/38*, *289F/1* and local *Doddahathi* from the standpoint of resistance to 'red leaf', vigour, lint length and lint percentage. Selections of *M.A. II* showed a greater degree of resistance to disease than *Co 2*. The F_1 generation of the crosses between *G. peruvianum* and *M.A. II* and *Co 2* were found to be more resistant to the disease than *M.A. II* or *Co 2*. It is reported that seed of *M.A. II* was distributed to replace local *Doddahathi* in several districts of Mysore and that seed of $\times 4383$ and $\times 3915$ was distributed for trial under *barani* conditions.

CHAPTER III.

SEED DISTRIBUTION AND EXTENSION SCHEMES.

At first, the grants made by the Committee were restricted to agricultural research, but in 1929 it was decided that the time had come to add support to the efforts already being made to bridge the gap between the experiment station and the cultivator, and to supplement the funds which the Agricultural Departments were devoting to the introduction of improvements into agricultural practice. Special attention has since been devoted to seed distribution schemes, and to the more extended distribution of pure seed of improved varieties of cotton. During the period under review, there were sixteen seed distribution and extension schemes in operation in the various cotton growing provinces and States; a brief report on the working of these schemes is given below :—

1. BOMBAY.

(a) **Surat Seed Distribution Scheme.**—This scheme was first sanctioned in November 1929 for a period of two years. In December 1931, it was extended for another two years, pending the final decision of the Committee on the cotton policy to be adopted in the Surat area. In January 1934, after a thorough examination of the relative merits of *1A* and *1027 A.L.F.*, the Committee finally decided in favour of the latter and extended the scheme for five years for the distribution of *1027 A.L.F.* seed in the Surat area. In November 1938, the scheme was extended for a further period of one year and again, in August 1939, for three years, from the 1st April 1940.

During the year under report, the Department of Agriculture controlled a seed multiplication area of 17,874 acres (including 1,687 acres grown with farm pedigree seed) against 11,756 acres (including 864 acres with farm pedigree seed) in the previous year and distributed 22,73,633 lbs. of seed (including 6,78,572 lbs. supplied to Indian States) against 19,63,486 lbs. (including 9,42,862 lbs. supplied to Indian States) in the previous year. Owing to the amendment of the Bombay Rules under the Cotton Transport Act, 1923, restricting the importation of inferior types of cotton, there was a good demand for *1027 A.L.F.* seed. It has been reported also that, as a result, all co-operative societies in Olpad and several other growers changed their policy and favoured the growing of *1027 A.L.F.* In the absence of provision in the amended Cotton Control Act, prohibiting the growth of other inferior cottons in the tract, some cultivators are reported to have openly grown *Surat 1A*.

This would indicate the need for the application of the amended Cotton Control Act to the whole area lying south of Nerbudda as early as possible.

A supplementary scheme, which was sanctioned in November 1938 with the object of controlling the spread of selection *IA*, came into operation on the 1st February, 1940. It is expected that as a result of the survey of the area south of the Tapti and with the opening of check stations, the infiltration of this selection as well as other inferior cottons into the Surat tract and other adjoining protected areas where *1027 A.L.F.* is grown will be prevented.

(b) **Khandesh (Jarila) Seed Distribution and Extension Scheme.**—This scheme was sanctioned in March 1937 for a period of ten months in the first instance, pending settlement of the policy regarding the apportionment of the cost of schemes between the Committee and Provincial Governments and States. On the settlement of this question, the scheme was extended, in January 1938 for a period of one year, and in November 1938, further extension of three years was granted. The object of the scheme is to replace *Banilla* in the Khandesh tract with *Jarila*, which is wilt resistant, over an area of about 1,55,000 acres.

During the year under report, 6,84,536 lbs. of *Jarila* seed were sown over an area of 30,079 acres, against 97,990 lbs. over 4,836 acres last year. The natural spread of this variety is estimated at 40,000 acres. 5,36,442 lbs. of pure seed were purchased and stocked for distribution during the next season. *Jarila* is reported to have given an average yield of 345½ lbs per acre against 309 7/12 lbs. of the local variety. About 6,680 bales of cotton, ginned under departmental supervision, were sold by auction at a premium of Rs 13 to Rs. 34 'ON' Broach, against Rs. 38 to Rs. 48 'ON' Broach, obtained in the previous year.

(c) **Deccan Canals (Banilla) Seed Distribution Scheme.**—This scheme was sanctioned in January 1934 for a period of five years and came into operation in April 1934. In August 1939, a further extension for five years was sanctioned. The object of the scheme is to supply pure *Banilla* seed for the irrigated tracts in the Sholapur, Poona and Ahmednagar districts.

During the year under review, 6,000 acres were under *Banilla* and 2,400 bales of improved cotton were produced which were sold at a premium of Rs. 2 per *palla* (240 lbs.) over the *local*. The profit realized by the cultivators by growing the improved cotton is estimated at Rs. 8,000. The operation of the scheme has been shifted from Kopergaon to Indapur Taluka.

(d) **B.D. 8 Seed Distribution Scheme.**—This scheme, which has for its object the distribution and extension of *B.D. 8* cotton, was sanctioned in

August 1935, for a period of three years, and came into operation in December 1935. It was extended, in July 1938, for a period of five years.

During the year under report, 30,951 acres were under *B.D. 8* as against 14,296 acres in 1938-39. The total area under cotton in the Broach district (excluding Ankleshwar *Taluka*) is 250,000 acres. 14,459 bales of pure *B.D. 8* were produced and sold through sale societies and gin-owners at premiums ranging from Rs. 20 to Rs. 39 'ON' Broach, against 10,208 bales sold at premiums ranging from Rs. 30 to Rs. 54 'ON' last year. The controlled area during the year was 12,718 acres from which 1,68,520 lbs. of seed were obtained. These, together with 860 lbs. obtained from the Broach farm, will be distributed to growers in the 1940-41 season.

(e) **Revised Jayawant and Gadag No. 1 Seed Distribution Scheme.**—This scheme, which was sanctioned in August 1935, for a period of five years, replaced five seed schemes in the Southern Division of the Bombay province, *viz.*, the Hubli, Gadag, Athani, Haveri and Bailhongal schemes. It came into operation on the 1st June, 1936, and in August 1940, it was extended for a further period of one year from the 1st June, 1941. The aim of the scheme is to eliminate local mixtures and to introduce pure *Jayawant* and *Gadag No. 1* cottons in the Southern Division of the Bombay province, so as to cover within five years, 9½ lakhs of acres with these cottons. The scheme is operated from seven centres, *viz.*, Hubli, Haveri, Navalgund, Bailhongal, Athani, Bijapur and Bagalkot, through the agency of co-operative societies under the general control of the Agricultural Department. Since 1st April, 1939, however, the control of all seed schemes in the Bombay province has been placed under the Registrar of Co-operative Societies and Director of Rural Development. Decentralisation is the keynote of the scheme, the idea being that no single agency should have too great an area to cover or too great a responsibility to shoulder.

During the year under report, 60,27,420 lbs. of pure *Jayawant* seed were sown over an area of 6,28,713 acres, against 30,99,320 lbs. of seed sown over an area of 3,24,197 acres last year. The natural spread of *Jayawant* is estimated at 1,50,000 acres, bringing the total area under this variety to about 7,79,000 acres. 14,08,400 lbs. of pure *Gadag No. 1* seed were sown over an area of 1,33,515 acres, against 11,29,600 lbs. of seed sown over an area of 1,12,944 acres last year. The natural spread of this variety is estimated at 25,000 acres, making a total of 1,59,000 acres. 78,54,000 lbs. of *Jayawant* seed and 18,49,800 lbs. of *Gadag No. 1* seed have been purchased for distribution in the 1940-41 season.

The cultivator's produce was pooled and sold by auction at different centres. In all 28,200 *docras** of *Jayawant* and 22,262 *docras* of *Gadag No 1* were sold during the year, against 29,108 *docras* of *Jayawant* and 31,895 *docras* of *Gadag No 1*, last year. The extra profit realised by cultivators is estimated at Rs 11,13,412 for *Jayawant* and Rs 3,40,060 for *Gadag No 1*.

(I) Scheme for maintenance of nucleus of pure seed of improved varieties of cotton.—In pursuance of the policy of the Committee that a nucleus of seed of all approved varieties of cotton should be maintained, a scheme for the maintenance of a nucleus of each of the following seven varieties of cotton was sanctioned in August 1937, for a period of five years —

- (1) 1027 A L F
- (2) B D 8
- (3) *Jarila* (Bhadgaon)
- (4) *Jarila* (Jalgaon)
- (5) *Jayawant*
- (6) *Gadag No 1*
- (7) *Banilla*

The total area sown and the quantity of sown seed of each variety produced during the year are given below —

Name of Variety	Area Sown		Amount of sown seed produced	Remarks
	Acres	Gunthas	Lbs	
(1) 1027 A L F	4	30	385	Larger area taken for sowing to take full advantage of short period of boll formation
(2) B D 8	1	0	326	555 lbs of open fertilised seed also produced
(3) <i>Jarila</i> (Bhadgaon)	2	0	300	. .
(4) <i>Jarila</i> (Jalgaon)	1	0	200	.
(5) <i>Jayawant</i> ..	2	0	284	Poor yield due to boll shedding
(6) <i>Gadag No 1</i>	2	0	650	.
(7) <i>Banilla</i>	1	0	110	.

* Weight variable, usually about 300/400 lbs

2. SIND.

(a) **Sind Seed Distribution and Extension Scheme.**—This scheme was sanctioned in December 1930 for a period of three years and came into operation in April 1931. It was extended in August 1933 for five years from the 1st April, 1934, and in November 1938, a further extension for two years was sanctioned. In August 1940, it was extended for a further period of five years from the 1st April, 1941.

The main objects of the scheme are :—

- (a) Varietal tests of improved strains—Sind American cottons.
- (b) Trials of high quality cottons—Egyptian and imported American cottons.
- (c) Demonstration of cotton cultivation on non-cotton growing areas on new barrage lands.
- (d) Seed multiplication, distribution and extension work.
- (e) Propaganda, demonstration and advisory work in connection with the extension of improved varieties of cotton and better methods of cultivation.
- (f) Assistance to cotton growers in marketing cotton.

The work on the Right Bank mainly consists of the extension of cotton cultivation, while on the Left Bank, attention is largely devoted to seed multiplication and distribution of improved varieties of cotton and the introduction of better methods of cultivation.

The work during the year continued on the lines of the past year ; there were 4,67,000 acres under improved varieties, representing 52% of the area under cotton in Sind, against 4,98,500 acres representing 54% of the area in the previous year. 8,214 maunds* of *Sind N.R.*, 33,190 *maunds* of *Sind Sudhar* and 7,293 *maunds* of *4F-98* were distributed during the year, against 15,052 *maunds* of *Sind N.R.*, 31,518 *maunds* of *Sind Sudhar* and 8,562 *maunds* of *4F-98* distributed last year. 2,06,000 bales of improved cottons were sold at an average premium of Rs. 7-8-0, giving a profit of Rs. 15,43,750 to the growers of improved varieties.

(b) **Scheme for maintenance of nucleus of pure seed of improved varieties of cotton.**—In pursuance of the policy of the Committee for the maintenance of a nucleus of seed of all varieties of cotton, the spread of which has

* 1 maund = 82-2/7 lbs.

been approved by it a nucleus scheme for the following five varieties of cotton was sanctioned in August 1937 for a period of five years —

- 1 *Sind N R*
- 2 *Sind Sudhar*
- 3 *AF 98*
- 4 *Sca Island 1 2 4* and
- 5 *Boss III 16*

The scheme came into operation in April 1938

The total area sown and the amount of selfed seed produced in 1939-40 as well as the area sown in 1940-41 under each variety are shown below —

Name of variety	Area sown in 1939-40		Selfed seed produced	Area sown in 1940-41
	Acres	Gunthas	lbs	Acres
<i>Sind N R</i>	1	15	230	12 5
<i>Sind Sudhar</i>	2	13	366	10 5
<i>AF 98</i>	1	2	298	15 0
<i>Sca Island 2 4</i>	0	20	94	3 0
<i>Boss III 16</i>				

(c) **Financing of Seed Distribution** — The Committee, at its meeting held in January 1938 sanctioned a scheme for the financing of seed distribution in Sind for a period of three years subject to the condition that the scheme would not be put into operation until the rules under the Cotton Ginning and Pressing Factories (Bombay Amendment) Act 1936 have been brought into force. The scheme has not yet been put into operation.

3 CENTRAL PROVINCES AND BIFAR

(a) **Verum Seed Distribution and Marketing Scheme** — In November 1929 the Committee sanctioned for a period of one year in the first instance the Central Provinces Verum Seed Distribution and Extension Scheme. It started

work in September 1930 and was extended annually up to the end of July 1934, when it was combined with the newly sanctioned scheme for the extension of long staple cottons in the Central Provinces. The combined scheme, known as "Scheme for Extension of Long Staple Cotton and Marketing of *Verum* cotton in the Central Provinces and Berar" was sanctioned for five years from June 1934. At the meeting of the Committee, held in July 1938, it was extended up to the 31st May 1941 the title being changed to "Scheme for the Extension and Marketing of V. 434 Cotton."

The aim of the scheme is to increase, by at least five times during the currency of the scheme, V. 434 cotton in the seven *Talugs* where *Verum* has made most headway in the past, the ultimate object being to eliminate all other short stapled varieties as far as possible. The area under V. 434 in the whole Province in 1938 was 62,032 acres and in the following year it rose to 86,076 acres in the selected *Talugs*. In addition, there were 52,349 acres in other parts of the Province, thus bringing the total area under V. 434 to 1,38,425 acres in 1939. As a result of the pooling operations in 1939-40, 7,081 *khandis** of pure seed were collected, out of which 1,148 *khandis* were taken over by the Government seed depots, and almost double that quantity by *Talug*, Associations for distribution. These, together with the seed returned to growers' will provide ample seed for expansion in 1940. The total number of bales pooled and sold by the marketing section was 8,246 of which 7,744 bales were of V. 434. Of the latter total, the special blocks contributed 4,936 bales. The premium obtained was Rs. 23 'ON' Broach and Rs. 51/15 'ON' Oomras. It is estimated that the total quantity of *Verum* produced in the Province amounted to 40,000 bales by the end of the year. Assuming that this was sold on an average of only Rs. 8 per *khandy* of *kapas*, the cultivators benefited to the extent of Rs. 4.8 lakhs by growing this cotton.

(b) **Scheme for Distribution and Marketing of Buri 107 cotton.**—This scheme aims at introducing, in the course of three years, *Buri 107*—a selection from acclimatised *Gossypium hirsutum*—in 30,000 acres now under mixed local *Buri*. It was sanctioned by the Committee in July 1938, for a period of three years, and came into operation on the 1st November, 1938.

During the year under report, the stipulated area of 10,000 acres was rogued and 492 *khandis* of first purity seed, sufficient to cover 30,000 acres, were available for distribution in 1940. 408 bales of *Buri 107* were sold through the Department Pool Organization, at an average premium of Rs. 34 'ON' Broach and Rs. 60-11-0 'ON' Oomras. It is reported that a

* 1 *Khandy* = 784 lbs.

further 1,000 bales were sold in the Burhanpur market. At the Akola this cotton is reported to have given an outturn of 830 lbs per acre.

(c) Maintenance of nucleus of pure seed of improved strains of cotton. This scheme for the maintenance of nucleus of pure seed for each of the cotton strains *V 434*, *Late Verum*, *No 438* and *Buri 107*, was sanctioned by the Committee in July 1938, for a period of five years from April 1938. The following table shows the quantity of selfed seed required to be produced and the quantity actually obtained from one acre each of the varieties —

Strain	Selfed seed required to be produced	Selfed seed produced
	lbs	lbs
<i>V 434</i>	200	390
<i>Late Verum</i>	200	253
<i>No 438</i>	200	293
<i>Buri 107</i>	200	380

4 MADRAS

(a) Madras Co 2 Seed Distribution Scheme — This scheme was sanctioned by the Committee in August 1932, for a period of five years, for the distribution of Co 2 seed in the Salem and Combatore districts through the agency of the Tiruppur Co operative Trading Society by organizing a seed multiplication area of not less than 6 000 acres and distributing enough pure seed for 1 00 000 acres every year. The scheme closed down on the 17th August, 1937. In January 1938, the Committee considered proposals for the extension of the scheme, but sanctioned a grant for one demonstrator and one manistry to help the Tiruppur Co operative Trading Society for a period of one year after which it was thought that no further assistance from the Committee would be required. In November 1938, the Committee extended the scheme for the distribution of Co 2 seed in Salem district for a further period of four years and five months. The Madras Government have, however, postponed the operation of the scheme.

The following table shows the progress made in respect of acreage under seed farms and the production of seed during the operation of the scheme:—

Year	Actual area under seed farms	Quantity of seed produced.	Sufficient to cover.
	Acre.	Mds.	Acre.
1932-33	1,739	19,914	20,000
1933-34	4,122	29,596	30,000
1934-35	5,152	53,515	51,000
1935-36	5,320	45,997	46,000
1936-37	5,117	34,917	35,000
1937-38	5,359	52,584	53,000
1938-39	3,200	10,758*	10,800

* Low quantity due to poor and insect damaged crop.

(b) Maintenance of nucleus of pure seed of improved varieties of cotton, Co. 2, H. 1 and K. 1.—This scheme was sanctioned by the Committee in January 1938 for a period of five years and came into operation in September 1938. The area selfed and the quantity of selfed seed produced of each variety during the year are given below:—

Name of variety.	Area selfed.	Amount of selfed seed produced.	How disposed of.
	Acre.	lbs.	
Co. 2	1.0	560	Issued for sowing 28 acres of inner seed farm at Tiruppur.
H.1	2.25	620	Sown on 39 acres at Hagari farm.
K.1	2.0	521	Sown on 32 acres at Koilpatti farm.

5. HYDERABAD STATE.

A *Seed Distribution Scheme* for the Hyderabad State was sanctioned in November 1929 for three years in the first instance and came into operation in March 1930. It was extended, in February 1933, for three years and again in January 1936, for another six months. In August 1936, it was extended for a further period of $4\frac{1}{2}$ years from the 1st September, 1936. The object of the scheme is to introduce improved strains of cotton in the Raichur District and to market the crop under favourable conditions so as to secure a better premium for the cultivator. During the first two years of the scheme, seeds of *Dharwar No. 1* and *Gadag No. 1* were distributed, but as a result of the experiments conducted by the Hyderabad and Bombay Agricultural Departments, the distribution of *Dharwar No. 1* seed was discontinued in favour of *Jayawant* which was found more suitable.

During the year under report, 4,48,821 lbs. of *Jayawant* seed were sown over an area of 35,319 acres and 268 lbs. of *Gadag No. 1* over an area of 20 acres against 2,54,918 lbs. of *Jayawant* over 21,706 acres and 2,520 lbs. of *Gadag No. 1* over 300 acres in 1938-39. The natural spread under *Jayawant* was 37,180 acres. Owing to unfavourable weather conditions, the outturn of *Jayawant* was 31 lbs. of lint per acre against 53 lbs. last year. It is proposed to purchase 5,60,000 lbs. of pure *Jayawant* seed sufficient to cover 40,000 acres in 1940-41.

The Kopbal Co-operative Cotton Sale Society, which was started in 1932, continued to co-operate with the Agricultural Department in the production and sale of pure seed and the holding of auction sales. During the year, sales at auction fetched premiums ranging from Rs. 10 to Rs. 20 'ON' Broach.

6. BARODA STATE.

(a) Baroda (Navsari Seed Storage) Scheme.—This scheme, which is concerned with the spread of *1027 A. L. F.* in the Navsari district of the Baroda State was sanctioned in February 1933, for a period of five years, subject to the condition that the Baroda Government would arrange a seed multiplication area of 1,000 to 2,000 acres in that district. Work on the scheme started in April 1934. At the meeting of the Committee in July 1938 the scheme was extended for a further period of five years from 1st April, 1939.

During the year under report, 38,908 lbs. of seed raised from pedigree seed were issued to 'A' class growers for sowing over an area of 2,833 acres,

2,39,870 lbs. to 'B' class growers for sowing over an area of 13,860 acres and 1,87,563 lbs. of pedigreed seed to 'C' class growers for sowing on 9,141 acres. The following table shows the progress of the scheme during the last six years:—

S. No.	Year.	No. of depots opened.	Seed issued.	Area covered by 1027 A.L.F.	% of 1027 A.L.F. to total area in district.
1	1934-35	5	231,285	18,382	9
2	1935-36	12	1,020,534	74,456	40
3	1936-37	8	314,433	75,000	33
4	1937-38	8	469,514	50,000	23
5	1938-39	8	449,787	50,000	22
6	1939-40	9	800,798	75,000	37

The produce of the improved seed was ginned and baled at selected centres, and stamped with AGMARK before selling. 6,745 bales of lint were sold at premiums varying from Rs. 5 to Rs. 20 per *khandy*, against about 1,787 bales sold last year at premiums ranging from Rs. 1-10-0 to Rs. 10 per *khandy*.

(b) **Baroda B. D. 8 Seed Distribution Scheme.**—This scheme, which has for its object the extension of *B. D. 8* cotton in Baroda District, was sanctioned in July 1938 for a period of five years and came into operation on the 1st April, 1939.

During the year under report, 83,760 lbs. of *B. D. 8* seed were distributed over an area of 7,680 acres against 81,690 lbs. over 8,000 acres last year. 69,640 lbs. of seed sufficient for 6,268 acres have been stocked for the next season. It is reported that the ginning percentage of *B. D. 8* dropped to 31.2 from 32.25 last year and that this reacted unfavourably on the popularity of the cotton. 780 bales of cotton were sold at premiums ranging from Rs. 21-8 to Rs. 39. Apart from this scheme, the Baroda Government organized seed multiplication over an area of 1,786 acres at Karjan, and 850 bales of *B. D. 8* cotton were produced and sold at premiums ranging from Rs. 17 to Rs. 31.

Since 1929 the undermentioned Seed Distribution and Extension Schemes financed by the Committee have closed down after completion of their sanctioned period or for other reasons. The work done under these schemes has been reviewed in previous reports —

Madras Province —

(1) *H 1*

(2) Madras (Tiruppur) Seed Extension Scheme

Bombay Province —

(3) Hubli

(4) Gadag

(5) Gadag Supplemental

(6) Atham

(7) Khandesh (*bán'la*)

United Provinces —

(8) *C 402*

Punjab —

(9) Lyallpur (Ginnery)

CHAPTER IV.

PROGRESS IN THE INTRODUCTION OF IMPROVED VARIETIES OF COTTON.

It is proposed in this chapter to give a brief review of the progress made in the introduction of improved varieties of cotton.

(i) BOMBAY.

The total area under cotton in the Bombay Province, including Indian States, during the year 1939-40 was 4,994,000 acres as shown below :—

	Acres.
Total British districts	3,498,000
Total Indian States	1,496,000
Total ..	4,994,000

The area under improved strains was distributed as follows :—

Name of Cotton.	Area (Acres) in 1939-40.	Where concentrated.
(1) 1027 A.L.F. ..	340,000	Tract lying south of Nerbudda river.
(2) B.D. S	43,000	Broach District.
(3) Jarila	70,000	Khandesh.
(4) Jayawant ..	851,000	Hubli, Navalgund, Haveri (Dharwar District), Bailhongal, Athani (Belgaum District), Bagalkot, Bijapur (Bijapur District), Tasgaon in Satara District.
(5) Gadag No. 1 ..	164,000	Gadag and Ron (Dharwar District).
(6) Banilla	37,000	Deccan Canals, Ahmednagar and Sholapur Districts.
Total ..	1,505,000	

(1) *1027 A L F* was evolved from a cross between *Kumpla* and *Goghari* cottons. It has a staple length of $15/16''$ and a ginning percentage of 33 to 36 and is capable of spinning up to 38 counts. It fetches a premium of Rs 10 to Rs 15 per *khandi* on local rate. During the past year, the department purchased in all 21 74,217 lbs of seed of this cotton, 22,614 lbs of this being the produce of the Surat farm. From this stock, 14,95,645 lbs were distributed in the district through 24 seed depôts opened in the interior and 6,78 572 lbs were supplied to the Rajpipla State. In addition, 99,416 lbs of seed were distributed direct by the Hansot Co operative Cotton Sale Society. The total quantity of seed distributed was thus 22,73 633 lbs. As a result of the passing of the Amended Cotton Transport Act of 1923, restricting the transport of seed cotton and cotton seed from the north of the Tapti into the Surat area, there was a large demand for the seed of *1027 A L F* and the majority of co operative cotton sale societies in Olpad and other societies in the remaining part of the district changed their policy in favour of growing *1027 A L F*.

(2) *B D 8* was originally selected from a cotton variety known as 'Purified Broach *Deshi*' grown on the Broach Farm. It has a staple length of $0.90''$ and a ginning percentage of 33.7 and is capable of spinning 37 counts. In the Broach district, the area under *B D 8* cotton is extending, as this strain has been found to be highly wilt resistant compared with the local cottons like *Goghari* and *Broach desi*. Out of the total area grown under *B D 8* cotton in this district, 12 716 acres were controlled by the Agricultural Department. The crop in the controlled area was inspected and 1,69 520 lbs of seed from this area were purchased by the department for further distribution. *B D 8*, during the year, fetched a premium of Rs 9 per *bhar* of 1,020 lbs of seed cotton and Rs 43 to Rs 55 per *khandi* of lint over *Broach*.

(3) *Jarila cotton*—As a result of breeding work on *Verum* cotton at the Jalgaon Farm, a new *Verum* selection now known as *Jarila* cotton has been evolved. It is wilt resistant and possesses fine staple ($13/16''$), capable of spinning 24 counts under mill conditions. With a ginning percentage of 33 to 35, it obtained during the year a premium of Rs 13 to Rs 34 on *Broach*, against Rs 38 to Rs 48 'ON' in the previous year. It is suited to the conditions obtaining in the Khandesh tract and is much appreciated by the cultivator and the trade. During the year under review, 6 84,536 lbs of seed, sufficient to cover 30,000 acres, were distributed under departmental control. In addition, there were about 196 acres under this cotton on the Jalgaon and Bhadgaon farms. It is estimated that there was an area of about 40,000

acres, under it by natural spread. Out of the pure seed produced on Government farms and on the controlled area, 9,04,000 lbs. were earmarked for distribution during the ensuing season.

(4) *Jayawant* is an isolate from a cross between *Dharwar I* and *Dharwar II*—two selections from local *Kumpla* cotton. It has a ginning percentage of 28 and is capable of spinning upto 40 counts. It is highly wilt-resistant under field conditions, and combines all the good characters of its parents.

(5) *Gadag No. 1* is a selection from the local *Dharwar-American* cotton. It has a staple length of $\frac{7}{8}$ " and a ginning percentage of 33 and is capable of spinning up to 30 counts. The work of extending the two improved varieties of cotton, viz., *Jayawant* and *Gadag No. 1*, was carried out on an extensive scale through the local agents and the Hubli, Gadag, Annigeri, Nargund and Bijapur Co-operative Cotton Sale Societies. The total reserved area maintained for multiplying pure pedigree seed of *Jayawant* at different centres was 97,749 acres as against 66,163 acres last year, while the reserved area under *Gadag No. 1* at Gadag and Ron centres was 31,120 acres against 23,156 acres in the previous year. The quantity of seed secured and stocked by the local agents and the co-operative cotton sale societies from these reserved areas was about 72,72,260 lbs. of *Jayawant* and about 15,53,400 lbs. of *Gadag No. 1*, sufficient to cover 7,27,226 and 1,55,340 acres, respectively, during 1940-41. In auction sales, *Jayawant* obtained on an average a premium of Rs. 15 and *Gadag No. 1* Rs. 25 per naga of seed cotton (1344 lbs.) over local cottons in the bazaar. *Jayawant* cotton is spreading in the Walwa and Tasgaon talukas of the Satara district also, where 21,588 lbs. of *Jayawant* seed, sufficient for about 2,200 acres, were supplied to the cultivators. The natural spread is estimated to be about 800 acres, making the total area under *Jayawant*, in the year, to be about 3,000 acres. The premium obtained for *Jayawant* cotton in the Sangli market ranged from Rs. 4 to Rs. 8 per cart over the local cotton.

(6) *Banilla* is a derivative of a cross between *bani* (a long staple, fine, silky but low ginning cotton) and *comilla* (a short staple but very high ginning cotton). The staple length of *Banilla* is 22/32" and ginning percentage 39 and it has been adjudged suitable for spinning 19s highest standard warp counts. It is, however, very susceptible to wilt and is, therefore, being replaced by *Jarila* in the Khandesh tract. Owing to its susceptibility to wilt the yield of *Banilla* has gradually gone down from 1,500 lbs. to 750 lbs. of seed cotton per acre.

(ii) SIND.

The total area under cotton in Sind during the year was about three times that during the decade preceding the opening of the Lloyd Barrage Scheme. The final estimated area under cotton in Sind (including Khairpur State) during the year under report was 904,000 acres against the revised figure of 902,000 acres in 1938-39. During the pre-Barrage decade, out of the total cotton acreage of 320,000 the area under American cotton was 25,650 acres, whereas, during 1939-40, out of the total of 904,000 acres, approximately 664,000 acres were under American. This increase is due to the assured and perennial supply of irrigation water, the extension of cultivation of improved and high yielding varieties and the introduction of better methods of land preparation and tillage. The present average yield per acre of the various cotton growing districts, given below, is nearly double that during the pre-Barrage decade :—

Hyderabad district	..	..	220 lbs. (average)
Nawabshah district	..	..	210 „ „
Tharparkar district	..	..	240 „ „
Right Bank	..	..	220 „ „

Improved varieties—The three main varieties found successful in Sind are *Sind desi*, *Sind-American* and imported Egyptian and Sea Island cottons. From these, by selection, improved strains have been evolved which on account of better yields, high ginning outturn and superior spinning quality have been found suitable for extension in general cultivation.

The total area under improved varieties during 1939-40 was 515,000 acres as shown below :—

					Acres
(i) <i>Sind Sudhar</i>	..	..	..	..	250,000
(ii) <i>4F-98</i>	..	..	..	..	63,000
(iii) <i>Sind N.R.</i>	..	..	..	..	202,000
Total					515,000

(i) *Sind Sudhar* has full 1" staple and spins about 40 counts. It is a high yielding cotton with a ginning percentage of about 29 to 30 in normal years. It is resistant to red leaf blight and jassid attack and can withstand seasonal variations of climate better than the ordinary *289-F* and other similar cottons. It is now grown all over the Indus Left Bank. The good premium obtained by this cotton during the last five years has resulted in a considerable increase in area under it. The Department distributed 34,980 *maunds* of seed of this strain for multiplication during the season 1940-41.

(ii) *4F-98*, which has been evolved from the *4F* ordinary cotton, has a staple length of $\frac{7}{8}$ " to $15/16$ " and is capable of spinning 34 counts. Its ginning outturn is 33% and it has been found to be the most suitable type for cultivation in the new cotton growing tracts on the right bank of the river Indus. About 7,309 *maunds* of seed of this strain was distributed by the Department amongst *zamindars* for the coming season.

(iii) The improved Sind *desi* cotton, known as Sind *N.R.*, is the standard *desi* cotton of Sind, occupying an area of about 225,000 acres. Its cultivation is confined to Nawabshah and upper part of Hyderabad District. Its yield is about 16 to 20% higher than the ordinary Sind *desi*. It possesses the further advantage of being a good ginner, the ginning outturn being 4 to 5% higher than that of ordinary *desi*. The Department distributed about 11,802 *maunds* of the improved seed of this strain for further multiplication in the year 1940-41.

(iii) PUNJAB.

The total area under cotton in the British districts of the Punjab was 2,641,105 acres, of which 93% was irrigated and the remainder unirrigated. The area under cotton represented a decrease of 9% on that of the previous year and nearly 16% on that of two years ago, when the record area of 3,135,531 acres was under cotton in the Punjab. The reduction in both the cases was due to inadequacy of rainfall at sowing time coupled with the effect of the low prices obtained for cotton in the previous year.

Of the total area under cotton, 1,432,000 acres were under *Punjab-American* varieties; thus the record established last year when *Punjab-American* cotton occupied 53.6% of the total cotton area in the Province was maintained. This year, the percentage of *Punjab-American* to the total cotton area was 54.2. The total baled crop according to press returns was 10,80,770 against 11,15,561 bales of 400 lbs. each in the previous year.

So far, as it has been possible to estimate, the area under improved varieties was roughly as follows:—

(a) *Punjab-American varieties*:—

	Acres.					
(i) <i>4F</i>	992,000
(ii) <i>L.S.S.</i>	153,000
(iii) <i>289F/43</i>	122,000
(iv) <i>289F</i> including <i>K.T.</i> types	165,000
Total	1,432,000

(b) *Improved Desi cottons* —

(i) <i>Mollison's</i>	660,000
(vi) <i>119 Sanguinetum</i>	10,000
(ii) Other types	539,105
Total	1,209,105

(i) *4F* was first distributed by the Department of Agriculture in 1914. The fibre length of this variety is $\frac{3}{8}$ " and it spins 20 to 25 counts. The ginning outturn is about 31%. A few years ago, it was the most important variety of American cotton in the province but now it is being replaced by new improved strains suited to different tracts. The seed of this cotton is stocked by the Agricultural Department's seed selling agencies, and the *zamindars* are advised to buy all their requirements from them.

(ii) *L S S* is a selection from *4F* and is chiefly grown in Lyallpur, Sheikhpura and parts of Sargodha districts. Its fibre length is 1" and it spins 40 counts. The ginning outturn is about 31%. When marketed in bulk, *L S S* fetches a better price than *4F*. It is a high yielding cotton, but matures late, and, therefore, requires one or two irrigations in October.

(iii) *289F/43* is a long stapled, high yielding early maturing variety of Punjab American cotton. It is resistant to the attack of jassids. The fibre length is $1\frac{1}{32}$ " and it spins 40 counts. The ginning outturn is 29%. The most noteworthy features of this strain are its tolerance to the shortage of water and its early maturing habit. In fact, it matures and gives the first picking along with *desi* cottons and, therefore, does not suffer from early frost. It is most popular in lower Bari Doab Canal Colony (except Khanewal Division), Nili Bar and inundation tracts. It has also proved successful in Lower Chenab Canal Colony. It withstands late sowing better than other varieties, especially in south western parts of the province, and if, for any reason late sowings up to the end of June have to be done, this variety should be preferred. Its low ginning outturn of only 29% compared with 33% in the case of *289F/K 25*, however, places it at a distinct disadvantage and despite the high quality of its lint, the market quotations for its *lapas*, during the year, were a few annas per *maund* less than those for cotton of poorer quality.

(iv) *289F/K 25* was selected by the British Cotton Growing Association (Punjab) Ltd, Khanewal, in 1932, and is at present grown over about 2 lacs of acres in parts of Multan and Montgomery districts. It is also being grown in parts of Bahawalpur State and Sind. The ginning outturn of this variety is 33%, the staple is also good and it has been adjudged suitable for spinning 40s highest standard warp counts. It is, however, very susceptible to jassids.

(v) *Mollisoni 39* is a tall growing variety and has a lint length of $5/8$ " and a ginning percentage of 35 to 36. Its yield is the highest amongst all the *desi* varieties and it has now become so popular with the growers of *desi* cotton in the Canal Colonies that, during the last three years, the demand for its seed has always exceeded the supply.

(vi) *119 Sanguineum* is another improved strain that bids fair to become the standard *desi* cotton of the south western tract. It gives higher yields than the local and its ginning outturn is 36% against 34% of the local *desi*. The market value of this cotton, at present, does not differ materially from the old variety, but when it becomes widely known, it will probably command a better price.

(iv) CENTRAL PROVINCES AND BERAR.

The total area under cotton in the Central Provinces and Berar during 1939-40 was 3,370,631 acres.

(i) The area under *V. 434* was 138,425 acres as compared with 63,700 acres in the previous year. *V. 434* is a pure line selection, evolved in 1932; its chief merit lies in its adaptability to varying conditions of soil and climate. It possesses, in addition to wilt resistance qualities, drought resistance, prolific flowering capacity, quickness in forming buds and setting fruit, comparative freedom from shedding and excellent lint characters and good ginning percentage. Its staple length is about 1" and it has been adjudged suitable for spinning 30s to 37s highest standard warp counts; the ginning percentage is 31. It is the best all round strain available at present and it is grown chiefly in the districts of Akola, Amraoti, Buldana, Yeotmal, Nimar, Wardha and Nagpur. The Agricultural Department has now decided to expand its cultivation also in the *taluks* of Chikhli, Mehkar, Basim, Pusad, Ellichpur, Khandwa and Harsud. 7081 *khandis* of pure seed of this cotton were collected during the year. Of this, 1,148 *khandis* were taken over by Government depôts for direct distribution. Approximately double that amount was taken by Taluk Agricultural Associations and the rest was returned to the growers. The premium obtained during the past season was Rs. 56 per *khandy* over the local *Oomras*. The total production of improved *Verums* during the season was nearly 40,000 bales.

(ii) The area under *buri 107*, which is a selection from acclimatised Upland American cotton, rose to 10,000 acres in the Burhanpur *tahsil* for which it has been found to be particularly suitable. A seed distribution scheme for this cotton has recently been sanctioned by the Committee and this was the second year of its working. No difficulty is anticipated in raising the area

under it to 30 000 acres in 1940 154 *khands* or pure seed of *buri 107* were taken over by Government seed depôt for distribution and further 338 *khands* were left to be distributed either by the cultivators themselves or by the Taluq Agricultural Associations

Buri 107 yields well but suffers from the defect of being a low ginner (27 to 28%) The staple is good though somewhat weak and it has been adjudged suitable for spinning up to 40s highest standard warp counts

(1) MADRAS

The total area under cotton in Madras during 1939 40 was 2 102 900 acres, the *Karunganni* cottons grown in the Salems and Tinnevellys tracts occupying 2 15 914 acres *Cambodia* 3 69 800 acres *Cocanala* 1 07 200 acres and the *Northerns* and *Westerns* 9 61 000 acres So far as it has been possible to estimate the area under improved varieties was roughly as follows —

Cambodia Cotton.—

Name of Strain	Name of District	Area of seed farm in acres	Seed Distributed by		Total area of improved strain in acres	Premium paid per lb of 400 lbs Rs
			Department lbs	Private agency lbs		
Co 2 in Southern areas	Coimbatore { D N D	830 980	34 682	6 43 300	1 42 003	to 7- 8-0 11 12-0
	Salem D	536½	37 910		19 380	
	Madura D	410	31 008		55 000	
	Trichinopoly		6 388		9 404	
	Ramnad				3 618	
	South Arcot		8 400		7 503	
	North Arcot		6 900		680	
Co 2 in other areas	Tinnevely				1 490	
	Bellary & Anantapur		972	3 100	410	
	Kurnool & Cuddapah		1 583	856	271	
	Northern Circars				26	
920	Ramnad Coimbatore and South Arcot }	93	30 639	1 405	10 156	Rs 25 on Co 2 Do
1267	Trichinopoly		1 000		393	
13915	Ramnad	58			800	
14383	Ramnad and South Arcot }	770	830		3 170	
14463	Coimbatore				320	
		5 686			2 54 670	

D = Departmental

N D = Non Departmental

Karunganni Cottons :—

Name of Strain.	Name of District.	Area of seed farms in acres.	Seed Distributed by		Total area in acres.		
			Department. lbs.	Private agency. lbs.			
K. 1	Madura	130	10,568	Not known.	11,050		
	Trichinopoly ..	....	1,896	....	328
	Tinnevelly ..	707	....	....	58,328
	Ramnad ..				46,003		
	Colmbatore.. ..	617			15,640		
Total ..	1,32,339						
C. 7 ..	Tinnevelly	161					15,500
	Colmbatore ..		35,967				
	Total ..		51,467				
A. 10 ..	Madura						8,000
	Trichinopoly ..						110
	Tinnevelly				750		
	Ramnad				23,248		
	Total ..				32,108		
GRAND TOTAL					2,15,914		

Northern Tract :—

Name of Strain.	Name of District.	Area of seed farms in acres.	Seed Distributed by		Total area in acres.	Premium paid per bale. Rs.
			Depart-ment. lbs.	Private agency. lbs.		
N. 14 ..	Kurnool	1,414	98,796	54,734	15,353	16
H. 1 ..	Kurnool .. ..	..	1,050	49,950	5,100	NIL.
	Cuddappah	127	5,030	25,090	3,012	..

Westerns Tract :—

Name of Strain.	Name of the District.	Area of seed farms in acres.	Seed Distributed by		Area under improved strains. Acres.	Premium paid per bale. Rs.
			Depart-ment. lbs.	Private agency. lbs.		
H. 1 ..	Bellary & Anantapur.	2,989	1,93,219	23,28,840	2,49,600	4

Cocanadas Tract:—

Only 100 acres were under an improved strain X20

The *Westerns* and *Northerns* form the biggest group as regards total area. The acreage and yields, however, fluctuate considerably, as the regions in which these cottons are grown are liable to suffer from frequent droughts and famines. The most important improved strain evolved in the *Westerns* and *Northerns* cottons are *H 1* and *N 14*, respectively. *H 1* (*Gossypium herbaceum* var *frutescens* Delile) which is a selection from another strain *H 25*, has a ginning percentage of 31 against 27 of the commercial *Westerns* and is grown on the black soils of Bellary district and in parts of Anantapur district. *N 14* (*Gossypium arboreum* var *neglectum* forma *indica* *H & G*) which was evolved by single plant selection in the *Northerns* cottons is considered to be one of the finest indigenous cottons of India. It has a staple length of 1" and a ginning percentage of about 24. The bolls, however, open badly and, therefore, it is somewhat difficult to pick. It thrives best on mixed soils in years of good rainfall.

Cambodia is the next important cotton. The total output of *Cambodia* has risen considerably, as a result of the increase that has taken place in the area under improved strains. *Co 2*, a selection from *Cambodia*, is a robust, jassid resistant, high yielding type and possesses large bolls which open widely. It has a lint length of about 1" and a ginning percentage of 33 to 35 and is estimated to benefit the grower to the extent of Rs 15 per acre. Recently, two more strains, viz, 920 and 1267, have been introduced and are gradually replacing *Co 2* in Coimbatore and Srivilliputhur taluks on account of their sturdier growth and less susceptibility to shedding. Two more strains which deserve mention here are x 3915 and x 4383, now called *Co 3* and *Co 4*, respectively, both of which are earlier and more prolific than either *Co 2* or 920, and are at the same time superior in respect of quality. Strain x 4383 is a derivative from a cross between *Co 2* x *A 12* (a South African cotton) and was evolved at the Cotton Breeding Station, Coimbatore, in 1936. It is earlier than *Co 2* by about three to four weeks, but although better in staple and capable of spinning 40s to 42s its ginning percentage is only 31 against 33 to 35 of *Co 2*. It is, however, valued at Rs 20 'ON' best *Cambodia*, and in the Ramnad district, where it was tried during the past few seasons, it gave 50 to 80% higher yield than *Co 2*. This year it has been grown on an area of 1,000 acres. Similarly, strain x 3915 has been obtained by hybridising *Co 2* with *U 4* (a South African Cotton). It is as early as x 4383, but is finer in staple and higher in ginning outturn (36 to 39%) than the latter. They are capable of spinning 42s to 50s highest standard warp counts.

The *Tinnevellics* include all *Karunganni* cottons grown in the province. As is well known, the commercial 'Tinnies' is a mixture of two cottons—*Karunganni* and *Uppam*. The former is distinctly superior to the latter in general yield and quality, as well as spinning performance. As a consequence, it brings in more money to the grower. The area under improved *Karunganni* has increased (especially in Coimbatore and Tinnevely districts) from 83,273 acres in 1930-31 to over 200,000 in 1938-39. The improved strains evolved under this cotton are *C. 7*, *A. 10* and *K. 1*. These have been evolved by selection in *Karunganni* at Koilpatti Agricultural Research Station. *C. 7* is suitable for tracts south and east of Koilpatti, while *A. 10* flourishes best in the regions north of Koilpatti. Both are alike as regards lint length and ginning percentage, but in spinning performance *C. 7* is superior. *K. 1*, on the other hand, was evolved by re-selection in *C. 7* in a year of drought. It is earlier and hardier than the latter, and thus does better than either *C. 7* and *A. 10* under adverse conditions. It is not affected by February rains, and has been found to give a higher yield than the local cottons. Owing to its earliness, drought resistance and non-shedding qualities, it is gaining ground and is expected soon to replace *C. 7* and *A. 10*.

Very little improvement has so far been effected in *Cocanadas* and *Salems* (excluding *Karungannics* grown in Coimbatore). Recently, however, a scheme for the improvement of *Cocanadas* cottons has been sanctioned by the Committee and it is hoped that suitable improved types will be developed in the course of a few years.

(vi) UNITED PROVINCES.

The total area under cotton in the United Provinces during 1939-40 was 4,83,649 acres. The area under improved strains is estimated to be :—

(i)	<i>C. 520</i>	..	..	..	33,000	acres.
(ii)	<i>Perso-American</i>	..	..	..	2,374	..
				Total	35,374	

(i) *C. 520* is a selection superior in quality and yield to the bulk crop of indigenous mixture of "U. P. Bengals." It possesses a staple of $5/8$ " and is capable of spinning 12 to 16 counts. The ginning outturn is 38%. The most noteworthy feature of this variety is its tolerance to vagaries of climate and early maturing habit associated with high yield. It is gaining popularity not only in the cotton tracts of the Province but also in certain Rajputana States.

(ii) *Perso American Cotton*—An acclimatised foreign cotton, has staple length of 25/32" and a ginning outturn of 32%, it spins 30s count. Attempts are being made to extend the area under this type in Aligarh and Budaun districts.

(iii) HYDERABAD STATE

The total area under cotton cultivation in H. E. H. the Nizam's Dominions during the year 1939-40 was 3,187,894 acres.

Gaorani Tract—4,388,160 lbs of pure seed of *Gaorani 6* which is a selection from the indigenous *Gaorani* cotton of the State, was purchased by the Department from the Reserved area of the last year and distributed on *tacavi* system, under Departmental control, to cover an area of 241,633 acres.

Aurangabad District—Pure seed of an improved strain, namely *P. bhani American*, which is a selection from the local American varieties obtained from the Reserved area of the last year amounting to 18,480 lbs, was purchased by the Department and distributed on *tacavi* system under Departmental control for an area of 1,818 acres to be multiplied up for general distribution.

Raichur District—In the Kumpta Cotton Protected area of Raichur district which is situated to the extreme south western portion of the Hyderabad State, the work of seed distribution of improved varieties of cotton, namely, *Jayawant* and *Gadag No 1*, was continued. The total quantity seed distributed by the Department of Agriculture was 448,821 lbs of *Jayawant* and 268 lbs of *Gadag No 1*. The improved varieties covered an area of 35,319 and 20 acres, respectively. The natural spread under *Jayawant* was 37,180 acres, thus bringing the total area under the improved variety to 72,519 acres.

(iv) BARODA STATE

Nasari District—Pure seed of 1027 *ALF*, issued by the State Seed Organisation to growers in the Navsari District, amounted to 9,82,410 lbs. This is expected to cover an area of 1 lac acres. In addition, the Organisation supplied 5,20,800 lbs of pedigree resultant seed to Rajppla State. The Vesma Farm issued 34,295 lbs of pedigree seed to be sown by 'A' grade seed farmers in 1940.

Baroda District—68,745 lbs of *B D 8* seed were issued. This was either pedigree seed from the Daboi Farm issued to 'A' grade seed farmers or 'A' Grade Seed issued to 'B' Grade growers. It is expected that there will be about 6,3

the Indian cotton crop has gradually been undergoing a change, will be apparent from the following table :—

CHANGE IN THE CHARACTER OF THE INDIAN COTTON CROP.

Indian cotton crop classified according to varieties and length of staple.

(Based chiefly on the 'Estimates of Area and Yield of Principal Crops in India' and 'Cotton Forecasts' published by the Department of Commercial Intelligence and Statistics in India).

(Excludes Burma). Quantities are in thousand bales* of 400 lbs. each.

Descriptions of Cotton.	Average 1928-29 to 1932-33.	Average 1933-34 to 1937-38.	1938-39.	1939-40.	Percentage increase (+) or decrease (-) of col. 5 over col. 2.
1	2	3	4	5	6
<i>Short staple—below $\frac{3}{8}$".</i>					
1. Bengals	906	1,349	1,012	979	
2. Oomras	1,734	1,344	1,085	1,220	
3. Central India ..	278	247	260	175	
4. Broach (Part) ..	58	163	233	242	
5. Dholleras	557	557	328	228	
6. Kumpta and Upland (Part)	(a)	(a)	50	34	
7. Bijapur and Bagalkot Jowari	(b)	(b)	173	39	103
8. Westerns (Part) ..					
9. Warangal and Coca- nadas	36	25	26	35	
10. Salems	37	34	4	4	
11. Chinnapathi	37	42	1	1	
12. Comillas					
Total—					
Quantity ..	3,643	3,761	3,214	3,100	—15
Short staple { % on 'Total All Staples'	74	68	63	62	

* Statistical bales containing 400 lbs. of cleaned (lint) cotton.

(a) Included under item (19), separate figures not being available.

(b) " " " (20), " " " " " " " " " " " "

Descriptions of Cotton	Average 1928 29 to 1932 33	Average 1933 34 to 1937 38	1938 39	1939 40	Percentage increase (+) or decrease (-) of col 5 over col 2
1	2	3	4	5	6
<i>Medium and Long Staple— 7" and above</i>					
13 <i>Americans†—Punjab and Sind—(Staple 1" and above)</i>	(c)	488	172	217	
14 <i>Americans—Punjab and Sind—(Staple below 1")</i>	244	691	891	700	
15 <i>Central Provinces and Berar Verum</i>	(d)	26	23	37	
16 <i>Hyderabad Gaorani</i>	126	135	127	143	
17 <i>Broach (part)</i>	} 210	137	10	15	
18 <i>Surti</i>			175	195	
19 <i>Kumbla and Upland (part)</i>	232	170	174	199	
20 <i>Westerns (part)</i>	} 223	196	43	31	
21 <i>White and Red Nor therns</i>			2	23	
22 <i>Tinnevelly (including Karungannies)</i>	144	139	13	158	
23 <i>Cambodias</i>	129	192	93	122	
24 <i>Jarila</i>			3	24	
25 <i>Buri</i>				17	
Total—Medium and long staple } Quantity	1 308	1 774	1 862	1 884	+44
} % on Total	26	32	37	38	
} All Staples					
Total—All Staples	4 951	5 530	5 076	4 984	+1

† Includes Punjab American 289 F and Punjab American 289 F/43 Sind Sulhar (Sind American 289 F 1)

† Excludes Punjab for the complete five year

(c) Included under it

(d) " " " (2) " " " " " "

It will be seen that the proportion of cotton of staple length $\frac{7}{8}$ " and above to the total production increased from 26% in the quinquennium 1928-33 to 32% in the quinquennium 1933-38; the proportion in 1939-40 was 38%.

There has also been a noticeable improvement in the yield per acre, as will be seen from the following table, in which two sets of figures, one based on the official crop forecasts and the other on the figures of actual crop accounted for by mill consumption, exports and extra-factory consumption, are given :—

CHANGES IN YIELDS OF COTTON IN INDIA.

(Excludes Burma).

Year. (1st Sept.-31st Aug.)	Area. (Thousand acres).	Production. Government estimates. (Thousand bales of 400 lbs. each).	Yield per acre. (lbs.). Col. 3 Col. 2	Production of cotton of staple length $\frac{7}{8}$ " and above. (Government estimates).		Approximate (Commercial) crop. (Thousand bales of 400 lbs. each).	Yield per acre calculated from approximate (Commercial) crop. (lbs.). Col. 7 Col. 2
				Actual. (Thousand bales of 400 lbs. each).	Per cent on total.		
1	2	3	4	5	6	7	8
Average 1922-27 ..	24,723	5,449	87	1,622	30	*5,954	96
„ 1927-32 ..	24,738	5,206	84	1,327	25	*5,851	95
„ 1932-37 ..	23,912	5,315	89	1,650	31	*6,447	108
1937-38 ..	25,746	5,722	89	1,770	31	†6,370	99
1938-39 ..	23,482	5,076	87	1,866	37	†6,051	103
1939-40 ..	21,356	4,984	93	1,884	38	†5,868	110

* Calculated from mill consumption (a) + exports (b) + extra-factory consumption (c). Variation in stocks has not, however, been taken into account.

(a) Mill consumption in Burma included up to 31st March 1937.

(b) Includes exports from Burma up to 1934-35.

(c) The new figure for extra-factory consumption, viz., 450,000 bales for the whole of India, based on enquiries conducted by the Committee, in selected areas, has been used throughout.

† Best estimate of the crop as arrived at by the Indian Central Cotton Committee in connection with the annual post-mortem examination of all-India cotton forecasts.

From the second set of figures given in column 8, it will be seen that the average yield per acre rose from 96 lbs. in the quinquennium 1922-27 to 108 lbs. in the quinquennium 1932-37. The average yield in 1939-40 was 110 lbs. per acre.

By the issue of bulletins, leaflets and press notes, from time to time, during the year, the grower and the trade were kept in touch with the statistical position of Indian cotton.

2. IMPROVEMENT OF COTTON FORECASTS.

The Final Report of the Bombay Cotton Forecast Improvement Scheme, to which reference was made in the last year's report, was published for general information, during the year under review and the attention of provincial and State forecasting authorities was drawn to the recommendations contained in the Report.

In connection with the adoption of the tentative estimate of 450 000 bales per annum for the extra factory consumption of cotton for the whole of India, it was felt that the figure of 233 000 bales, taken for the Punjab and included in the all India estimate was probably on the high side, owing to the fact that the figure of *per capita* consumption of the investigated villages was applied to rural (village) as well as to urban (town) population. It was accordingly decided to undertake a separate investigation to ascertain the consumption, for domestic purposes, of cotton in towns in the Punjab, and a small grant for the purpose was sanctioned by the Committee. This investigation showed that the difference between the rural and urban *per capita* consumption figures was not considerable and that the estimate of total urban consumption in the Punjab, arrived at from the present enquiry, is less than that based on the original enquiry by only 1 215 bales. It has, therefore, been decided not to modify the estimate of 233 000 bales adopted at present, for the Punjab.

As reported before, the all India cotton forecasts of each season are subjected to a post mortem examination, by the Cotton Forecast Sub Committee of the Indian Central Cotton Committee, at the close of the season with a view to detecting sources of errors and suggesting remedial measures. During the year under report, as a result of the examination of the all India cotton forecasts of 1938-39 season, the question of applying a correction factor to the annual valuation figures reported for Sind and the Gujerat block of the Bombay Province, is at present under consideration. Further with a view to rectifying the sources of errors revealed by such post mortem examinations the forecasting authorities of the Provinces and States have been requested to give effect, as far as possible, to the recommendations contained in the Final Report of the Bombay Cotton Forecast Improvement Scheme which have been approved by the Committee.

One of the factors used in the preparation of cotton forecasts in India is the "standard yield" which may be defined as 'an average crop on average soil in an year of average character'. The standard yields were fixed for each district several years ago and have not been materially revised since, except

in the Provinces of Bombay, Sind and the Punjab, where the standard yields were re-fixed recently after examination of the available data. The position was reviewed by the Indian Central Cotton Committee and it was felt that in order to improve the cotton forecasts, a systematic and scientific revision of the standard yield figures was desirable, the first essential being the devising of a proper sampling technique for obtaining the average yield. The major cotton growing provinces were accordingly invited to submit proposals for crop-cutting experiments on cotton in limited areas and a co-ordinated scheme of crop-cutting experiments on cotton on an all-India basis was formulated. The co-ordinated scheme, together with the views on it of the provincial authorities concerned, was examined by a Special Sub-Committee and on its recommendation, a scheme has been sanctioned for one year, in the first instance, at a total cost of about Rs. 20,000 for the Punjab, the Central Provinces and Berar and Madras. This scheme is essentially of an exploratory nature; the object is to determine the optimum density of sampling and the optimum size of a sampling unit with reference to the "variance" or "error function" and the "cost function" in each particular zone.

As in the past, by arrangement with the Director-General of Commercial Intelligence and Statistics, the estimates of the cotton crop were received by wire and released in Bombay at a time previously fixed to synchronise with the time of their release in Calcutta.

3. COLLECTION OF STATISTICS OF COTTON IMPORTED INTO BOMBAY BY ROAD.

Reference was made in the last year's report to the proposed collection of the statistics of cotton imported into Bombay by road, through the agency of the Bombay Port Trust, the expenditure on this account to be borne by the Committee, the East India Cotton Association, the Bombay Chamber of Commerce and certain other interested parties. The proposal will be given effect to as soon as the necessary legislation, empowering the Bombay Port Trust with the required authority, is passed by the Government of Bombay.

4. STAPLE LENGTH OF THE INDIAN COTTON CROP.

A Report on the estimated production of cotton according to staple length for 1939-40 season was issued in May; the trade estimates of the crop were also presented in this report. Of the official estimate of 4,984,000 bales (compared with the trade estimate of 5,943,000 bales), 6% was of staple length 1" and above and 32% of staple length $\frac{7}{8}$ " to $31/32$ ".

5. REPORT ON THE ACCURACY OF THE ALL-INDIA COTTON FORECASTS.

The fourth issue of this Report, pertaining to the season 1938-39, was published in July. According to the report, the commercial crop of 1939-40 was estimated to be in the neighbourhood of 6,051,000 bales, whilst the figure forecasted in April 1939, was 5,120,000 bales. The forecast estimate was thus lower by 15 per cent on the basis of the actual crop as arrived at by the Committee. This was accounted for by the observed underestimation in the forecasts of the United Provinces, the Punjab, Sind, Bombay Province, Madras Province, Central India and Rajasthan.

6. STATISTICS OF COTTON PRESSED.

Under the provisions of the Cotton Ginning and Pressing Factories Act, 1925, every cotton pressing factory in British India is required to submit, to the prescribed authority, weekly returns of the number of bales pressed in it. Indian States having pressing factories have also co-operated in enforcing the submission of similar returns by factories situated within their limits. The all-India figures of cotton pressed are published weekly in the Indian Trade Journal. In addition to the figures in running bales, their equivalents in statistical bales of 400 lbs. net are compiled by the Director General of Commercial Intelligence and Statistics and published monthly in the same Journal.

The Committee expressed its concurrence with the suggestion of the East India Cotton Association that the statistics of cotton pressed should be compiled on the basis of the recognised trade descriptions as adopted in the revised trade classification* of Indian cottons. As this involved an amendment of the Cotton Ginning and Pressing Factories Rules framed by the Provincial Governments, the Government of India were addressed and they have referred the matter to the Provincial Governments for opinion.

During the season 1939-40, 3,603,800 bales of cotton were pressed in British India and 1,381,130 bales in Indian States, making a total of 4,984,930 bales for all-India; the corresponding figures for 1938-39 were 3,602,286, 1,502,105 and 5,221,451 bales, respectively. For India as a whole, the average net weight per bale of cotton pressed during the season under report amounted to 392 lbs, which is the same as in the previous season.

7. UNPRESSED (LOOSE) COTTON STATISTICS.

The statistics of cotton pressed do not account for the whole of the Indian cotton crop as, apart from the quantity utilised for extra-factory consumption,

* Appendix III (page 135.)

chiefly in the form of *kapas*, mills situated in cotton growing areas often use considerable quantities of ginned, unpressed cotton. Prior to 1936-37, the relevant statistics relating to unpressed cotton were compiled on a voluntary basis but from 1936-37, they are being collected under statute by an amendment of the form of return submitted by mills under the Indian Cotton Cess Act, 1923. Similar information for Indian States is obtained on a voluntary basis through the courtesy of the Darbars concerned. During the year, 464,028 bales of unpressed cotton were consumed in mills in India against 458,119 bales during the preceding year. The relevant figures for 1926-27 to 1939-40 are given in Appendix IV to this report.

8. STATISTICS OF COTTON GINNED.

The question of instituting ginning returns on an all-India basis has been under the consideration of the Committee recently, as it was felt that such returns would, by supplementing the returns of cotton pressed, give a more complete indication of the cotton crop of the country. The figures of cotton pressed do not cover the entire crop as, apart from ginned unpressed cotton consumed in spinning mills for which figures are available, both ginned unpressed cotton and *kapas* are also utilised for domestic purposes, such as, hand-spinning, making of quilts, mattresses, etc., for which there are no reliable data. With the institution of ginning returns, however, all that would be necessary for arriving at the actual crop would be to estimate the quantity of *kapas* used for domestic purposes. The two returns would at the same time serve as checks on each other. The submission of ginning returns is already in force in the Central Provinces and Berar, while in the Bombay Province, the institution of such returns* for which provision exists in the Cotton Ginning and Pressing Factories (Bombay Amendment) Act, 1936, is under contemplation. In view of these considerations, it was decided that the various cotton growing provinces and States other than Bombay and the Central Provinces and Berar should be requested to take steps to amend the existing Cotton Ginning and Pressing Factories Act or other similar legislation in force, to provide for the monthly submission of returns of cotton ginned by ginning factories. The authorities concerned have been addressed accordingly.

9. INDIAN MILL CONSUMPTION.

Figures of consumption of Indian cotton in mills in British India and Indian States for the years 1925-26 to 1939-40, based on the monthly statements issued by the Committee, are given in Appendix IV. The total consumption

* Since instituted from September 1940.

of Indian cotton in mills in India during the season under report, viz., 3 01 bales, showed a slight reduction as compared with the record figure of previous season. It may however be mentioned in this connection that consumption in March and partly in April was affected by a prolonged strike in the mill industry in Bombay and Delhi however showed consumption in the Bombay Province decreased by 11% on the previous year. Slightly increased activity compared with the previous season. Consumption of Indian cotton in the Madras Province the figure for the month of July 1940, viz. 48 615 bales being the highest recorded for the Province for any month. The monthly average in 1938-39 was 40 070 bales.

10 EXPORTS

The exports of Indian cotton from British India during the season totalled 2 345 000 bales against 3 274 000 bales in 1938-39. On the average of the five financial years ending 1938-39 the value of cotton (including waste) exported from British India formed 41% of the total value of Raw materials and produce and articles mainly unmanufactured exported and 20% of the total value of all merchandise exported.

11 STOCKS

As in the past, mills, trade associations market committees and other authorities gave valuable assistance in the collection of figures of stocks of cotton held in the country at the end of the season. Much ground however still remains to be covered before the statistics can be claimed to be complete. The information collected in respect of stocks held on the 31st August, 1940 is contained in Appendix V. Stocks of Indian cotton held in India at the end of the season 1939-40 increased by 165 000 bales over the previous year. Of the stocks of 1 037,000 bales held by the trade (excluding spinning mills) on August 31, 1940, against 803 000 bales on the corresponding date of the previous year, increases were recorded mainly under Americans, Oomras and Broach.

As the season adopted for the cotton crop of the Madras province is the year ending 31st January figures of stocks held in the province on this date collected annually in addition to the figures relating to the 31st August relevant figures for the 31st January 1940 together with comparative figures for previous years, are given in Appendix V.

chiefly in the form of *kapas*, mills situated in cotton growing areas often use considerable quantities of ginned, unpressed cotton. Prior to 1936-37, the relevant statistics relating to unpressed cotton were compiled on a voluntary basis but from 1936-37, they are being collected under statute by an amendment of the form of return submitted by mills under the Indian Cotton Cess Act, 1923. Similar information for Indian States is obtained on a voluntary basis through the courtesy of the Darbars concerned. During the year, 464,028 bales of unpressed cotton were consumed in mills in India against 458,119 bales during the preceding year. The relevant figures for 1926-27 to 1939-40 are given in Appendix IV to this report.

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The question of instituting ginning returns on an all-India basis has been under the consideration of the Committee recently, as it was felt that such returns would, by supplementing the returns of cotton pressed, give a more complete indication of the cotton crop of the country. The figures of cotton pressed do not cover the entire crop as, apart from ginned unpressed cotton consumed in spinning mills for which figures are available, both ginned unpressed cotton and *kapas* are also utilised for domestic purposes, such as, hand-spinning, making of quilts, mattresses, etc., for which there are no reliable data. With the institution of ginning returns, however, all that would be necessary for arriving at the actual crop would be to estimate the quantity of *kapas* used for domestic purposes. The two returns would at the same time serve as checks on each other. The submission of ginning returns is already in force in the Central Provinces and Berar, while in the Bombay Province, the institution of such returns* for which provision exists in the Cotton Ginning and Pressing Factories (Bombay Amendment) Act, 1936, is under contemplation. In view of these considerations, it was decided that the various cotton growing provinces and States other than Bombay and the Central Provinces and Berar should be requested to take steps to amend the existing Cotton Ginning and Pressing Factories Act or other similar legislation in force, to provide for the monthly submission of returns of cotton ginned by ginning factories. The authorities concerned have been addressed accordingly.

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* Since instituted from September 1940.

of Indian cotton in mills in India during the season under report, viz, 3,017, bales, showed a slight reduction as compared with the record figure of the previous season. It may however, be mentioned in this connection that consumption in March and partly in April was affected by a prolonged strike in the mill industry in Bombay Island. As a result consumption of Indian cotton in the Bombay Province decreased by 11% on the previous year. Consumption in the Madras Province, Punjab and Delhi however showed slightly increased activity as compared with the previous season. Consumption of Indian cotton in the Madras Province which amounted to 507,085 bales, established another record during the season, the figure for the month of July 1940, viz, 48,615 bales being the highest recorded for the Province for any month. The monthly average in 1938-39 was 40,070 bales.

10 EXPORTS

The exports of Indian cotton from British India during the season totalled 2,345,000 bales against 3,274,000 bales in 1938-39. On the average of the five financial years ending 1938-39 the value of cotton (including waste) exported from British India formed 41% of the total value of raw materials and produce and articles mainly unmanufactured exported and 20% of the total value of all merchandise exported.

11 STOCKS

As in the past, mills, trade associations, market committees and other authorities gave valuable assistance in the collection of figures of stocks of cotton held in the country at the end of the season. Much ground however still remains to be covered before the statistics can be claimed to be complete. The information collected in respect of stocks held on the 31st August, 1940, is contained in Appendix V. Stocks of Indian cotton held in India at the end of the season 1939-40 increased by 165,000 bales over the previous year. The stocks of 1,037,000 bales held by the trade (excluding spinning mills) on August 31, 1940, against 803,000 bales on the corresponding date of the previous year, increases were recorded mainly under Americans, Oomras and Broach.

As the season adopted for the cotton crop of the Madras province is the ending 31st January, figures of stocks held in the province on this date collected annually in addition to the figures relating to the 31st August. Relevant figures for the 31st January 1940, together with comparative figures for previous years, are given in Appendix V.

12. DEMAND FOR VARIOUS TYPES OF INDIAN COTTON.

Statistics relating to internal and export demand for various types of Indian cotton are compiled in the Secretary's office from information furnished on a voluntary basis. These are of considerable value, not only to the trade and industry but also to those entrusted with the responsibility of shaping and directing the cotton policy of the country. The statistics collected for the year 1939-40 are contained in Statistical Leaflets Nos. 3* and 4† (1939-40).

Receipts at mills during the season were higher by 68,000 bales while exports were down by 957,000 bales, as compared with the previous season. Export demand for short staple varieties, particularly *Dholleras*, *Broach*, *Oomras*, *Central India* and *Comillas* showed a marked falling off, the total shrinkage in the exports of such cotton (below seven-eighths of an inch in staple) being 758,000 bales against 199,000 bales under long and medium staple.

13. PERIODICAL REVIEWS OF THE STATE OF FOREIGN TRADE IN INDIAN COTTON.

By arrangement with the Director General of Commercial Intelligence and Statistics, a clerk is employed in his office, at the Committee's expense, with the object of furnishing monthly reviews on the state of foreign trade in Indian cotton. These reviews, besides giving information on the developments in the cotton situation in general, also contain statistics relating to Indian cotton based on the British Indian trade accounts as well as on the trade accounts of the importing countries. The reviews are supplied to trade bodies represented on the Committee and to cotton spinning mills on request; they are also available to the public at a small charge.

14. PUBLICATIONS.

The undermentioned statistical publications were issued during the year under report :—

- (1) Final Report of the Bombay Cotton Forecast Improvement Scheme, 1934-39.
- (2) *Statistical Leaflet No. 2.*—Sixth Issue (1938-39), "Stocks of Indian raw cotton held in India by the mills and the trade on 31st August, 1939."

- (3) *Statistical Leaflet No 3*—Sixth Issue (1938 39) Receipts at mills in India of raw cotton classified by varieties—1938 39 season "
 - (4) *Statistical Leaflet No 4*—Sixth Issue (1938 39), ' Exports by sea of Indian raw cotton classified by varieties—1938 39 season "
 - (5) *Statistical Leaflet No 1*—Seventh Issue (1939 40), " Report on the staple length of the Indian cotton crop of 1939 40 season "
 - (6) *Statistical Leaflet No 5*—Fourth Issue (1938 39) ' Report on the accuracy of the all India cotton forecasts of 1938 39 season "
 - (7) *Statistical Bulletin No 9*—' Supply and distribution of the various types of Indian cotton during the season of 1938 39 "
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CHAPTER VI.

GENERAL.

I. IMPROVEMENT IN MARKETING.

Realising from the outset that improvement in the science and practice of agriculture must go hand in hand with improvement in the method of disposal of the produce, much attention has been devoted by the Committee to the improvement of primary cotton marketing. Regulated cotton markets existed in Berar before the establishment of the Indian Central Cotton Committee and that system which had stood the test of time was commended with certain modifications for general adoption. An investigation into the financing and marketing of cultivators' cotton was conducted by the Committee and this established beyond doubt that in those tracts where regulated markets exist the cultivators obtain better prices for their cotton. In view of this, Provincial Governments were requested to take steps for the establishment of regulated markets. As a result of this, legislation for the establishment of such markets has been enacted in Bombay and the Central Provinces, and in Madras the establishment of regulated cotton markets has been provided for under the Commercial Crops Markets Act. Hyderabad, Indore and some other Indian States have also passed similar legislation, and open markets have been established. The present position in this connection is indicated below.

With the passing of the Bombay Agricultural Produce Markets Act, 1939, the Bombay Cotton Markets Act, 1927, has now been repealed, but provision has been made in the new Act to recognise the regulated markets established under the Bombay Cotton Markets Act, 1927. After publication of the rules under the Act, the markets will be in a position to frame their own bye-laws. The three cotton markets established at Hubli, Gadag and Nargund mentioned in last year's report have not yet commenced to function.

In the Madras Province, Nandyal and Adoni Municipalities have been notified as markets for cotton under the Madras Commercial Crops Markets Act. The Tiruppur regulated cotton market, which has been in existence

since 1933, continued to function during the year. The desirability of opening cotton markets at other centres in the Coimbatore district is being examined by the Provincial Government.

In the Central Provinces, there were regulated cotton markets at Pulgaon, Wardha, Arvi, Hingnaghat, Chanda, Warora and Katol. Proposals for the opening of regulated cotton markets at Khundwa, Burhanpur, and Bir in the Nimar district, and at Nagpur, Khamptee, Kondhali, Narkhed, Khatwa, Kalmeshwar and Umrer are under the consideration of the Provincial Government, while enquiries have been instituted in respect of Pandhurna and Seoni Chhapara markets.

In the Punjab the Punjab Agricultural Produce Markets Act provides for the better regulation of the purchase and sale of and the establishment of markets for, agricultural produce including cotton. Rules under the Act, however, have not yet been framed.

Rules* under the Baroda Agricultural Produce Markets Act have been issued and made applicable to the Bodeli Market (Baroda District).

In the Hyderabad State, in addition to the 15 markets at Aurangabad, Jalna, Partur, Sulu, Hingoli, Nanded, Umri, Bhansa, Nizamabad, Adilabad, Warangal, Khammam, Raichur, Bidpalhi and Latur, the Agricultural Produce Markets Act was extended during the year to six new centres, namely, Bidar, Bhongir, Dharmabad, Gulburga, Peddapalli and Puri. The Act is applicable to all important agricultural produce including cotton.

In Sindh State, a Huzur Order regulating the sale and purchase of commercial crops in the State continued to be in force.

In connection with the adoption of a definite cotton policy in Gujarat, one of the views expressed was that, as the crux of the whole problem centred round the better marketing of 1027 A L F cotton, the Agricultural Produce (Grading and Marking) Act should be utilised to enable this cotton to be marketed as a special grade of Surat cotton. The Government of India were accordingly requested to include cotton in the schedule to the Act to enable specified varieties of cotton to be protected under it, the intention being that once cotton is included in the schedule, specified varieties of cotton produced in specified areas could then be stamped with a special mark, the unauthorised use of which would be illegal under the Act. The recommendation was accepted by the Government of India and 1027 A L F grown in certain tracts

* Appendix VIII (page 147)

in Gujerat (Bombay Province) is now being marketed under a special AG-MARK. The application of the rules to 289F-1 (*Sind Sudhar*) has also been approved by the Committee and the required draft of notification has been published by the Government of India.

In January 1938, the Indian Central Cotton Committee sanctioned a scheme for a cotton marketing survey in the Punjab, with the object of collecting all available information on the system of marketing cotton in the Province, so that, based on the data collected, suitable suggestions for improvement in marketing and for the establishment of regulated markets might be made. This scheme came into operation in September 1938, and terminated in February 1940. The survey included a detailed study of all the phases and channels through which cotton passes from the time it leaves the field to its final destination through the various intermediaries, and it also dealt with marketing practices in so far as they concern stocks and carry-over, the procedure in the ginning and pressing factories, baling and pressing charges and the despatch of cotton to various consuming centres. The report was duly considered by the Committee, and suitable action, wherever feasible, is being taken by the Provincial Government on the findings in the report. In accordance with the decision of the Committee, the work done under the scheme has also been brought to the notice of other Provincial Governments and the various States, and they have been requested to examine the desirability of undertaking similar surveys in suitable areas in their own provinces in consultation with the local marketing officers and interests concerned.

2. UNIVERSAL STANDARDS FOR INDIAN COTTONS IN INDIA.

Prior to 1933, standards for Indian cotton were prepared by the East India Cotton Association and the Karachi Cotton Association. The latter Association had standards for *Bengals*, *Sind*, *Punjab-American* and *Sind-American* cottons, whilst the former had standards for these as well as other varieties. As, however, the standards prepared by these two Associations in respect of the same varieties of cotton were different and resulted in a certain amount of competition between the two markets, the position was considered to be detrimental to the interests of the cotton grower. It was, therefore, decided that the Committee should consider in co-operation with the two Associations concerned, the question of adopting standards which would be of universal application in India. The two Associations were accordingly approached in the matter, and with their co-operation for the first time in 1934 standards common to the Bombay and Karachi markets were prepared by a Special Sub-Committee of the Indian Central Cotton Committee known

as the Standards Sub Committee. The preparation of these standards has now become an annual feature in the activities of the Committee. During the year, universal standards for the following varieties of cotton were prepared —

1	<i>Bengals,</i>	6	<i>Mathias,</i>	11	289F Roller Ginned Punjab,
2	<i>Sind,</i>	7	<i>Broach,</i>	12	289 F Roller Ginned Sind,
3	<i>Punjab American,</i>	8	<i>Dholleras,</i>	13	289F Saw Ginned Punjab,
4	<i>Sind American,</i>	9	<i>Kumplas,</i>	14	289 F Saw Ginned Sind
5	<i>Oomras,</i>	10	4 F Saw Ginned Punjab,		

The Karachi Cotton Association have adopted the universal standards of the Committee as the basis for their own standards and it has been recommended to the East India Cotton Association that trading in the Bombay market should be transacted on the basis of the universal standards of the Committee.

The Standards Sub Committee while passing the universal standards for Berars and Broach for the 1938-39 season also compared the standards of the Liverpool Cotton Association for those cottons and expressed the view that the Liverpool standards were much inferior to and not at all representative of the actual growth of Berars and Broach. The matter was accordingly taken up with the Liverpool Cotton Association and arrangements were made to supply them with copies of sets of standards used by the respective Associations in India, universal standards of the 1939-40 season of Broach and Oomras cottons were supplied by the East India Cotton Association and those of Bengals, Sind, Saw ginned Punjab American and Roller ginned Punjab American by the Karachi Cotton Association.

3 LEGISLATION.

In order to check the spread of undesirable or inferior types of cotton and insect pests and diseases and other malpractices several legislative measures have been passed by the Central and Provincial Governments on the recommendation of the Indian Central Cotton Committee. A brief description of these is given below.

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as the Standards Sub Committee The preparation of these standards has now become an annual feature in the activities of the Committee During the year, universal standards for the following varieties of cotton were prepared —

1	<i>Bengals,</i>	6	<i>Malwas,</i>	11	<i>289I' Roller Ginned Punjab,</i>
2	<i>Sind,</i>	7	<i>Broach,</i>	12	<i>289 F' Roller Ginned Sind,</i>
3	<i>Punjab American,</i>	8	<i>Dholleras</i>	13	<i>289F Saw Ginned Punjab</i>
4	<i>Sind American,</i>	9	<i>Aumplas</i>	14	<i>289 F' Saw Ginned Sind</i>
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3 LEGISLATION.

In order to check the spread of undesirable or inferior types of cotton and insect pests and diseases and other malpractices several legislative measures have been passed by the Central and Provincial Governments on the recommendation of the Indian Central Cotton Committee A brief summary of these is given below

(1) **Cotton Ginning and Pressing Factories Act.**—The Cotton Ginning and Pressing Factories Act, 1925, applies to the whole of British India and practically all cotton growing Indian States have passed similar legislation. This Act requires every bale of cotton to be stamped with a special mark showing where it was pressed; the Act also regulates certain matters connected with the management of cotton ginning and pressing factories and makes compulsory the submission by pressing factories of weekly returns of cotton pressed. Modifications in the rules have been called for from time to time, but the working of the Act has undoubtedly been a salutary check on malpractices. The Act, as amended by the Provinces of Bombay and the Central Provinces and Berar, prohibits watering, mixing and admixture of cotton and makes it obligatory on all cotton ginning and pressing factories situated in areas to which the Act is applied to obtain licences for their working. The question of enforcing the provisions of the Cotton Ginning and Pressing Factories (Bombay Amendment) Act in the Province of Sind is under the consideration of that Provincial Government. The enactment of similar legislation in the Provinces of Madras and the Punjab is under contemplation.

The Bill to further amend the Central Provinces Cotton Ginning and Pressing Factories Act to give effect to the recommendations of the Pools Committee appointed by the Provincial Government to examine the question of the effect of pools on ginning and pressing charges became law* during the year. The rules† framed by the Provincial Government under the Act were considered by the Committee and the attention of the Provincial Government was drawn to the absence of any provision in the rules in respect of the recommendations of the Committee regarding the restriction on the erection of new factories and the establishment of an appellate authority to whom appeals and revisions against the orders of the Rates Fixing Committee would be referred.

During the year under report, a complaint was received from the Manchester Cotton Association, Ltd., regarding illegible marks on bales shipped from Bombay, and this was brought to the notice of the shippers concerned. It was at the same time suggested to the Association that the spinners concerned should make their complaints direct to the suppliers whenever difficulty was experienced in reading the marks on bales imported from India. It was further pointed out that, to enable the Committee to follow up the matter in any particular case, identification marks and other details relating to the bales in question should invariably be furnished. As stated in the last year's report; a case pertaining to indecipherable press marks filed against a

* Appendix IX (page 159).

† Appendix X (page 161).

factory was withdrawn on the advice of the Assistant Public Prosecutor, Ahmedabad, on the ground that the evidence of the then Secretary of the Committee who made the report was not recorded and that unnecessary expense and trouble would be involved in proceeding with the prosecution in the absence of conclusive evidence. On enquiry as to the nature of the evidence required to secure conviction, the Assistant Public Prosecutor expressed the opinion that the best evidence would have been the production of the hoops themselves or their photos coupled with the evidence of the seller, the survey clerk and one of the arbitrators of the East India Cotton Association. This opinion was forwarded to the East India Cotton Association which pointed out that if the special mark and the serial number were stencilled on the hessian only, as was permissible under the rules it would not be possible to remove the hessian and preserve it. The suggestion that photos should be taken was also not considered feasible by the Association. It accordingly proposed that the Government of India should be requested to amend the Cotton Ginning and Pressing Factories Act 1925, so as to make it legal for a duly certified arbitration award of a regularly constituted trading association to be used in Court as evidence in prosecutions under Section 4 of the Act, without the necessity for the appearance in Court of the arbitrators who made the award. The Government of India were accordingly addressed but they could not see their way to amend the Act as suggested. In recording the reply of the Government of India the Committee decided that the Association should be requested to continue to depute a reliable witness other than the arbitrators to be present at the time when the arbitrators were examining the bales under dispute, so that his evidence would be available, if at any time required.

Out of 70 Indian States which have enforced in their territories the main provisions of the Cotton Ginning and Pressing Factories Act as applied to British India, by legislation or executive orders, weekly returns of cotton pressed were received from 61, in the remaining 9 States, pressing factories did not work during the year.

Complaints regarding the presence of foreign matter in Indian cotton were received from the Manchester Cotton Association Ltd, and the International Federation of Master Cotton Spinners and Manufacturers' Associations, but as no particulars were supplied, these bodies were informed that, when lodging complaints, the press marks and the running numbers of the bales in question should be sent so as to enable the matter to be investigated. The Federation subsequently intimated that the complaints made were about East Indian Cottons in general and did not refer to any par-

ticular case. This reply was considered by the Committee and the Federation was informed that while the Indian Central Cotton Committee was only too anxious to investigate complaints of this nature against Indian cotton, it was most difficult to pursue the matter and take effective action unless full particulars and running numbers of the bales complained of were known. It was pointed out also that the Committee had received no complaints of the kind from any other source.

Complaints regarding watering of cotton in Broach forwarded by the East India Cotton Association were brought to the notice of the authorities who instructed the staff concerned to record cases and submit quarterly reports of inspection of the factories in respect of which complaints were made. In the Punjab, an accused prosecuted under Section 9(3) of the Act relating to structural requirements of factories was discharged owing to the lack of reliable evidence. Of the two cases reported in previous years which were proceeded with under Section 9(4)(b) of the Act, in one the owners were fined and in the other further proceedings were withdrawn as the owners reduced the number of gins to four. In one case instituted under Section 3(5) (a) and (c) of the Act in respect of the maintenance of registers, the owners were fined Rs. 20 each.

(ii) **Prevention of introduction of Foreign Cotton Pests**—In order to prevent the introduction into India of the Mexican Boll-weevil (*Anthonomus grandis*) with imported American cotton, at the instance of the Committee, regulations have been imposed by the Government of India under which the import of American cotton into India is prohibited except through the port of Bombay where it must be fumigated with hydrocyanic acid gas before entry into the country. The work of fumigation is carried out under the technical supervision of the Secretary, and the cost involved is met by the levy of a small fee from importers on each bale of American cotton fumigated. The imports of American cotton during the year under review amounted to 83,140 bales against 2,861 bales in the preceding year. A rebate of fumigation fees at the rate of five annas per square bale and three annas per round bale on all American cotton fumigated during the year ending 31st March, 1940, was granted by the Government of India on the recommendation of the Committee and paid to the importers.

The Red (Sudan) Bollworm (*Diparopsis castanea*) and other pests.—The restriction on the import of foreign *kafas* (unginned cotton) and of foreign cotton seed remained in force throughout the year. Sixty-four parcels of foreign cotton seed were received during the year, examined and fumigated, where necessary.

(iii) **Madras Cotton Control Act**—This Act which came into force in 1932, prohibits the cultivation and mixing of the short staple *neglectum* cotton, locally known as *pulichai*, in the long staple cotton growing tracts producing *Tinnevellys*, *Karungannur* and *Cambodias*. It is reported that no breach of the Act was committed in the Coimbatore district. A few stray plants of *pulichai* cotton were, however, noticed in the Madura district (Tirumangalam Taluk) but these were promptly removed. The cultivation of *pulichai* cotton, however, was on the increase in the Tinnevely district, the number of prosecutions launched against the cultivators totalled 240 and the fines levied amounted to Rs 1,213. Sixty-nine cases were still pending in the courts at the close of the year.

(iv) **Bombay Cotton Control Act**—To check the spread of *Goghari* a short staple high ginning *herbacum* cotton, which threatened to invade the long staple cotton areas in Gujarat, the Bombay Government passed the Bombay Cotton Control Act in 1935 under which the cultivation, mixing or possession of *Goghari* in specified areas is a penal offence. As a result of the introduction of the Act and vigorous propaganda by the Agricultural Department, *Goghari* has completely disappeared from the areas where it was at one time extensively grown. During the year under review the Act is reported to have worked satisfactorily in the area south of the Narmada. There is, however, the potential danger of the spread of another variety inferior to 1027 A L F, viz, *Selection 11*, in parts of the Surat district where *Goghari* was formerly grown, and, if the extension of this cotton is to be controlled, the Act would require to be so amended as to empower the Provincial Government to prohibit the cultivation and handling of any specified type or types of cotton the spread of which the Provincial Government may desire to restrict. For this purpose the Provincial Government have drafted a bill to replace the existing Bombay Cotton Control Act.

(v) **Central Provinces Cotton Control Act**—This Act, which was passed into law towards the end of 1936, has for its object the elimination from the Central Provinces and Berar, of Garrow Hill cotton, a very inferior, coarse but prolific variety, which threatens to mar the reputation of the Central Provinces cotton and thus to nullify the efforts of the Agricultural Department in the matter of cotton improvement. The Act has been applied for a period of five years to the districts of Nagpur, Wardha, Amraoti, Yeotmal, Buldhana, Akola and Nimar and Sansar *tehsil* of Chhindwara district. The application of the Act late in the 1938 season gave little time to the Department of Agriculture to carry on propaganda among the cultivators with the result that the area under Garrow Hill cotton during the season was not much affected. From the

beginning of 1939, however, systematic propaganda has been carried out by the Department and the area under *V. 434* has considerably increased. During the year it was noticed that the cultivation of Garrow Hill cotton was still carried on in certain areas and measures for ensuring more satisfactory control are under the consideration of the authorities concerned.

(vi) **Baroda Cotton Control Act.**—The Bombay Cotton Control Act of 1935 has, by a notification of the Baroda State, dated the 25th April, 1936, been applied to the State with certain modifications to meet its own requirements. This Act prohibits the cultivation of *Goghari* cotton in the Navsari District of the State. Subsequent observations have shown that the presence of this cotton, even in field sowings, was very small, thus proving that the introduction of this Act has achieved its purpose.

(vii) **Bhopal Cotton Control Act.**—The Bhopal Cotton Control Act, which was enacted in April 1937, aims at promoting the cultivation of superior cottons and prohibiting the growing of inferior cottons in the Bhopal State. The State Department of Agriculture is working out a scheme to ensure an adequate supply of pure seed. However, since the preliminary work has not yet been completed, the Act has not come into operation.

(viii) **United Provinces Cotton Pest Control Act.**—As reported last year, this Act has been passed into law and rules have been framed under it. However, the final publication of the rules has been postponed for the time being.

(ix) **Cotton Transport Act.**—The clean-up measures described above may be considered as being largely supplementary to the Cotton Transport Act which was passed by the Central Government in 1923 at the instance of the Indian Central Cotton Committee. This Act enables Provincial Governments to prohibit the import of cotton, *lapas* or seed into specified areas from outside unless required for a special purpose and covered by a licence. Under this Act, protected areas have been notified in the provinces of Bombay, Madras and the Central Provinces and Berar as also in the States of Hyderabad, Baroda, Indore, Gwalior, Rajpipla, Sangli, Chhota Udepur, Lunawada, Bhaderwa, Kadana, Sant, Sanjeli, Jambughoda and Baria. A brief account of the working of the Act in the Provinces and States is given below.

Bombay.—The protected areas in the Bombay province remained unchanged. In the tract south of the Narbada, where the Act was put into operation in May 1939, half pressed bales from Olpad were permitted to be transported under licence to Surat for full pressing under departmental supervision and were duly marked "Olpad." The total number of bales thus marked was

20,172 (T P) Licences were also granted for the transport of cotton from some villages in Ankleshwar Taluka for sale to guns in Olpad. The Bombay Government have issued a notification which permits cotton from protected areas in Baroda States to be imported into the corresponding protected areas of Bombay Province without a licence.

In the Karnatak tracts, application of the Act was very effective in the case of imports by rail. To prevent illicit imports by road, check stations were opened on the main roads on the borders of protected areas. During the year under report, there were 20 temporary and 6 permanent check stations.

Madras.—The Act worked smoothly and there was no change in the protected areas.

Central Provinces.—The protected areas in the Central Provinces and Berar remained unchanged in the year under review.

The protected areas in the Hyderabad, Baroda, Indore, Rajpipla, Sangli, Chhota Udepur, Baria, Lunawada, Bhadarwa, Kadana, Sant, Sanjeli and Jambughoda States remained unchanged during the year.

Gwalior State.—There was no change in the protected areas. Certain island tracts viz., Gangapore, Bhesoda, Nikumbh, Mandafia, etc., except Nee much and Jawad, were excluded from the protected areas to enable the gun owners in those localities to import cotton from outside in order to keep their guns working.

4. COLLECTION AND SUPPLY OF INFORMATION.

As usual, notes on the progress in the introduction of improved varieties of cotton in the provinces and Indian States and on the work of the Committee were supplied to the East India Cotton Association and the Karachi Cotton Association for publication. The weekly statements of purchases and arrivals of American cotton were published for general information. The names of pressing factories in Indian States with the requisite details regarding press marks, name of owner or occupier, etc., were communicated to the Director General of Commercial Intelligence and Statistics, Calcutta, for publication in the Indian Trade Journal and for incorporation in the all India list of cotton ginning and pressing factories published by that Department.

Press notes and leaflets describing the various activities of the Committee and other matters of interest to the cotton industry in general were issued from time to time, during the year.

5. PUBLICATIONS.

Several important scientific and technical journals are received by the Committee, partly by subscription and partly on an exchange basis. These are circulated among its research workers who are thereby enabled to keep in touch with the latest scientific literature which otherwise would not ordinarily be accessible to them.

The Committee desires to express its indebtedness to those institutions which have placed its name on their free mailing lists, in particular to the British Cotton Industry Research Association for its Summary of Current Literature and the Shirley Institute Memoirs, and to the Empire Cotton Growing Corporation, the British Cotton Growing Association and the East India Cotton Association and the Karachi Cotton Association, for the supply of their publications. The Committee also records its thanks to the Indian Trade Commissioner, London, the U.S.A. Department of Agriculture, the U.S.A. Agricultural Experiment Stations, the Lingnan University, Canton, China, the Mitsubishi Economic Research Bureau, Tokio, Japan, the Egyptian Ministry of Agriculture, Technical and Scientific Service, the Liverpool Cotton Association, the Imperial Agricultural Bureau, London, the Imperial Bureau of Plant Genetics, Cambridge, the Manchester Cotton Association, the Textile Institute, Manchester, the Imperial Institute, London, the Indian Statistical Institute, the National Institute of Sciences, Calcutta, and other Associations and Chambers of Commerce for supplying the Committee with their reports, statistics and other valuable literature from time to time.

6. RESEARCH STUDENTS.

In the beginning, the Committee had perforce to undertake the training of research workers in the various branches of science pertaining to cotton for employment on its research schemes. Gradually, however, the necessity for this has disappeared, and scholarships are now, generally speaking, only granted whenever need arises for research workers with specialised training in a particular branch of science to meet the requirements of one or other of the Committee's schemes. Distinguished graduates are selected and placed for training under experienced research workers either on the Committee's schemes in the provinces, at the Institute of Plant Industry, Indore, at the Committee's Technological Laboratory or under professors in Indian Universities. Sometimes scholarships are also awarded for specialised training at recognised institutions abroad. The term of scholarship is usually two years, but extensions are sometimes sanctioned if found necessary.

Scholarships are awarded under two categories, viz, training grants and general scholarships. The former are intended for Government servants who are recommended by provincial Governments and for employees of the Committee who are considered suitable. General scholarships are awarded to University Graduates who are selected by the Research Students Selection Sub Committee. Applications for this class of scholarships are invited by advertisement.

Fifty four scholarships and nine training grants have been awarded so far, out of these, one scholarship and six training grants were for students abroad. During the year under report, one research student was under training in England.

Expenditure on research studentships up to the 31st August, 1940, amounted to Rs 2,78,979

D N MAHTA,

Secretary

APPENDIX I.

MEMBERS OF THE COMMITTEE

(1) PRESIDENT—

Mr P M Kharegat, CIL, ICS, Vice Chairman Imperial Council of Agricultural Research *ex officio*

(a) Dr W Burns, CIE, Agricultural Commissioner with the Government of India *ex officio*

(2) REPRESENTATIVES OF AGRICULTURAL DEPARTMENTS—

<i>Madras</i>	Mr A R C Westlake ICS Director of Agriculture
<i>Bombay</i>	The Director of Agriculture
<i>United Provinces</i>	Mr Vishnu Sahay ICS, Director of Agriculture
<i>Punjab</i>	The Director of Agriculture
<i>Central Provinces and Berar</i>	Mr J O McDougall IAS, Director of Agriculture
<i>Sind</i>	Rao Saheb K I Thadani Director of Agriculture

(3) THE DIRECTOR GENERAL OF COMMERCIAL INTELLIGENCE AND STATISTICS *ex officio*

(4) REPRESENTATIVES OF CHAMBERS OF COMMERCE AND ASSOCIATIONS—

The East India Cotton Association	Sir Purnhotamdas Thakurdas CIE MBI
The Bombay Millowners Association	Mr S D Saklatvala M L A
The Bombay Chamber of Commerce	Mr L F H Goodwin
The Indian Merchants Chamber	Mr Chunilal B Mehta
The Karachi Chamber of Commerce	Mr A P Darlow
The Ahmedabad Millowners Association	Mr Chandulal P Panki
The Tuticorin Chamber of Commerce	Mr J Vonesch
The Upper India Chamber of Commerce	Captain S R Pocock MC M L A
The Empire Cotton Growing Corporation	Sr William Roberts CIE

(5) COMMERCIAL REPRESENTATIVES NOMINATED BY CENTRAL GOVERNMENT—

<i>Central Provinces and Berar</i>	{ Rao Saheb P V Deshmukh
<i>Madras</i>	{ Mr Y G Deshpande
<i>Punjab</i>	{ Mr J M Doak
<i>Bengal representative</i>	{ Kanwar Raj Nath
	{ Mr Ginja Prosanna Chakraverty

(7) CO-OPERATIVE BANKING REPRESENTATIVE—

Sir Chunilal V Mehta KCSI (Vice President)

(8) REPRESENTATIVES OF COTTON GROWING INDUSTRY—

<i>Madras</i>	{ Rao Bahadur R V Ramasundaram
	{ Pillai
	{ Mr H Sitarama Reddy

<i>Bombay</i>	{ Mr. Yashwantram Rajaram Joshi, Mr. Mangesh Babhuta Patel, M.L.A.
<i>United Provinces</i>	{ Chaudhari Shivamangal Singh, M.L.A., Rai Bahadur Kunwar Laxmi Raj Singh, M.L.C.
<i>Punjab</i>	{ Sardar Bahadur Gurbachan Singh, M.L.A., Ch. Mohammad Yasin Khan, M.L.A.
<i>Central Provinces and Berar</i>	{ Rao Bahadur Sir Madhaorao Deshpande, K.B.E., Mr. Suganchand Tapadia.
<i>Sind</i>	Mr. Roger Thomas.

(9) AND (10) REPRESENTATIVES OF INDIAN STATES—

<i>Hydrabad State</i>	Mr. Nizam-ud Din Hyder, Director of Agriculture.
<i>Baroda State</i>	Mr. R. G. Allan, C.I.E., Commissioner of Agriculture.
<i>Gwalior State</i>	Lt. Sardar D. K. Jadhav, Director of Agriculture.
<i>Rajputana and Central India States</i> ..	Mr. T. R. Low, I.A.S.

(11) ADDITIONAL MEMBERS NOMINATED BY THE GOVERNOR-GENERAL IN COUNCIL :—

1. Rao Bahadur S. S. Salimath, Deputy Director of Agriculture, Southern Division, Dharwar.
2. Mr. T. G. Rama Iyer, Director of Agriculture in Mysore, Bangalore.
3. Rao Bahadur V. Ramanatha Ayyar Avl., Cotton Specialist, Coimbatore.
4. Rai Bahadur S. V. Kanungo, Revenue Minister, Holkar State, Representative of the Holkar State.
5. Dr. Chellaram Shewaram, Representative of the Karachi Indian Merchants' Association.
6. Dr. B. L. Sethi, Economic Botanist (Cotton & Rabi Cereals) to the Government of the United Provinces, Cawnpore.
7. The Hon'ble Mr. V. Ramadas Pantulu, President, Madras Provincial Co-operative Bank, Madras.
8. Lala Shri Ram, Representative of the Cotton Millowners of Delhi.
9. Mr. Jivandas Ladhahbai, Representative of the Karachi Cotton Association, Ltd.
10. Dewan Bahadur Vijayaraghavacharya, K.B.E.
11. Sardar Rao F Naik, Sagrampura, Surat.
12. Dr. T. E. Gre the Government of India.

APPENDIX II.
BALANCE SHEET AS AT 31ST MARCH, 1940

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BALANCE SHEET AS AT 31st MARCH, 1940—(contd.)

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RECEIPTS.	Rs.	a. p.	Rs.	a. p.	EXPENDITURE.	Rs.	a. p.	Rs.	a. p.
Brought forward	1,57,30,859	14 3			Brought forward	5,59,586	7 3	23,66,460	3 10
					(ii) Madras :—				
					(1) Pay and allowance of Business Manager, Tiruppur	24,079	13 0		
					(2) Co.2	41,286	3 3		
					(3) H.1	3,952	2 9		
					(4) Maintenance of nucleus of pure seed of improved varieties of cotton ..	1,153	5 3		
					(iii) Sind :—				
					(1) Seed Distribution ..	3,79,613	2 9		
					(2) Maintenance of nucleus of pure seed of improved varieties of cotton ..	5,000	0 0		
					(iv) Hyderabad :—	48,346	5 3		
					(v) Central Provinces :—				
					(1) Extension of long staple cotton and Marketing of Yerum Cotton ..	2,76,802	10 7		
					(2) Distribution and Marketing of Buri 107 cotton ..	5,698	0 0		
					(3) Maintenance of nucleus of pure seed of improved varieties of cotton ..	1,400	0 0		
					(vi) Baroda :—				
					(1) Navsari Storage ..	18,821	11 7		
					(2) B. D. 8 ..	2,699	0 0		
					(vii) Lyallpur (Ginnery) ..	10,038	3 3		
					(viii) United Provinces C.402 ..	18,017	7 6	14,03,094	8 5
					D. Printing and Propaganda :—				
					(1) Publicity & Propaganda ..	1,56,555	15 0		
					(2) Printing & Distribution ..	88,087	14 9	2,44,643	13 9
Carried over	1,57,30,859	14 3			Carried over			40,14,108	10 0

RECEIPTS	Rs	a	p	Rs	a	p	EXPENDITURE	Rs.	a.	p.	Rs	a	p
Brought forward				1,57,30,800	14	3	E Brought forward .. F Statistical Research -- (1) Studies of Village consumption of Indian Cotton (2) Improvement of Cotton Forecasts F Travelling Allowance -- Non-official members .. H Technological Research -- (1) A Technological Laboratory (Capital Expenditure) -- (1) Land & Buildings (2) Machinery (3) Freight (4) Apparatus & Equipment (5) Machinery & Workshop H Working Expenses -- (1) Provincial (2) Development of alternative uses for Indian cottons III Research Studentships Less--Refund from Mr. Tashkir Ahmad IV AGRICULTURAL RESEARCH GRANTS Bombay -- 1 A Surat Physiological 2 B Surat Bolloworm H Propaganda C Writing up 3 A Dharwar Wilt B Writing up Carried over	24,277	6	2	40,14,198	10	0
								30,772	0	0	55,049	14	2
											2,22,220	10	0
								4,07,993	14	0	31,09,086	3	2
								1,19,522	1	2			
								7,602	2	8			
								41,558	3	7			
								3,789	8	3			
								23,42,878	15	1			
								1,67,638	5	0			
								23,210	0	2			
								2,79,744	3	0			
								1,742	0	0			
								2,45,139	11	3			
								5,814	7	8			
								1,14,509	9	7			
								91,469	9	2			
								2,315	3	0			
								1,62,836	4	11			
								10,902	10	3			
Carried over				1,57,30,859	14	3		6,52,986	7	10	76,78,557	0	10

RECEIPTS Brought forward BALANCE SHEET AS AT 31st MARCH, 1940—(concl'd.) Rs a. p. Rs a. p. 1,57,30,859 14 3

EXPENDITURE

XXI Brought forward	Rs	a	p.	Rs	a	p.
(a) Punjab Cotton Marketing Survey	61,24,879	2	0	61,24,879	2	0
(b) Baroda Better Marketing of 1027 A L F.	7,323	2	3	7,323	2	3
XII Loan Recoverable but considered doubtful	3,612	14	10	3,612	14	10
Hubli Co-operative Society By Suspense account						
By Balance						
GRAND TOTAL	1,57,30,859	14	3	1,57,30,859	14	3

GRAND TOTAL

01,35,815 3 1

6,353 2 0
6,800 0 8
20,01,273 14 8
1,57,30,859 14 3

BALANCE SHEET AS AT 31st MARCH, 1940—(contd.)

RECEIPTS.	Rs. a. p.	Rs. a. p.	EXPENDITURE.	Rs. a. p.	Rs. a. p.
Brought forward	1,57,30,859 14 3		Brought forward	5,77,213 10 11	76,75,17 9 13
			XIII. Hyderabad.—		
			(a) Botanical	5,42,953 7 8	
			(b) Cotton Survey	35,573 3 0	
			(c) Pink and Spotted Bollworm	81,905 1 10	
			(d) Improvement of Kurnool cotton	14,011 15 7	
			(e) Inclusion of Northern and Western in Dry Farming Scheme at Raleghur	1,005 0 0	
			(f) Pink and Spotted Bollworm Clean-up Campaign	34,471 0 0	
			Total	5,11,140 8 1	
			XIII. Bikaner-Bengal	57,199 5 2	
			XIV. Baroda.—		
			(a) Root Rot	76,787 14 7	
			(b) Comparative Tests	1,251 3 3	
			(c) Survey of Goahri Cotton	3,472 7 0	
			(d) Plant Puller Propaganda	24,984 7 0	
			Total	1,03,600 2 7	
			XV. Bengal Comilla	24,658 12 9	
			XVI. Mysore Doddabathi	11,050 3 0	
			XVII. Collection of Iran Cottons	3,114 3 0	
			XVIII. Improvement of Dhollerai Cotton.—		
			(a) Wagad Cottons at Viramgam	14,100 11 5	
			(b) Mathla Cotton at Anreli and Ja- gudan	9,761 0 1	
			XIX. Preliminary Scheme at Sawanagar	323 12 1	
			XX. Estimation of effects on cotton crop of the use of Plant Puller	1,113 12 5	
Carried over	1,57,30,859 14 3		Carried over	61,21,870 2 0	

PROVIDENT FUND ACCOUNT AS AT 31st MARCH, 1940.

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RECEIPTS.	Rs.	a.	p.	Rs.	a.	p.	EXPENDITURE.	Rs.	a.	p.	Rs.	a.	p.
Subscribers' contribution account	3,42,405	13	10				By advance to Subscribers	56,357	15	0			
Less—Payment made to subscribers resigned ..	1,02,094	5	10	2,39,712	8	0	Less—Recovery made up to 31st March, 1940..	52,417	10	0	3,40	5	0
Committee's contribution account	3,34,363	1	5				Accrued interest on total capital upto 31-3-1940, credited to subscribers' contribution ..				5,167	14	10
Less—Payment made to subscribers resigned and forfeitures for Committee's contributions disallowed							By Balance				5,01,422	1	2
Suspense deposit of Mr. Dutt's own contribu- tion	99,134	15	1	2,35,228	2	1							
Investment Fluctuation account				1,200	7	7							
Lapse and Forfeiture account				26,037	10	5							
Suspense Receipts for amount due to the sub- scribers resigned:— (1) Mr. W. R. Sahani 1,475 10 5 (2) Mr. Luchmandas 641 1 2 (3) Dr. S. S. Verma .. 3,338 1 0				2,890	14	7							
				5,154	13	1							
TOTAL ..				5,10,530	5	0	TOTAL ..				5,10,530	5	0

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31st MARCH, 1940

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RECEIPTS	Rs	a	p	Rs	a	p	EXPENDITURE	Rs	a	p	Rs	a	p
* Opening Balance	18 96,223	4	8				Administration of the Committee (including Improvement of Cotton Marketing Seed Distribution and Extension Scheme, Lifting and Propaganda Statistical Research and Travelling Allowance of Non Official Members)				3 06,000	0	7
Less—Payments of Leave Pay to Staff for 1938-1939	100	5	0	18 96,223	15	8	Agricultural Research Grants in Aid (including Marketing Scheme)				3 82,719	2	10
Receipts under Section 12 of the Indian Cotton Cess Act, 1923				6 99,974	0	9	Technological Research				2 09,353	7	3
** Other Receipts				1 46,238	15	5	Closing Balance —						
Interest on Investments				81 550	12	2	(Government Paper at Cost)						
* Includes Rs 11,040-5-0 on account of Shikhar Fund and Rs 6,966-0-0 Loans Recoverable from Mobil Co-operative Cotton Sales Society							* 3½% Government of India Loan 1947-50 of the Face Value of Rs 4,50,000	3 03,314	1	0			
* Includes Rs 1,731-6-0 against provision for sinking fund for the year 1939-40 Rs 1,800 received for sales of consignment of Machine Tools on account of 16-7-39 on account of Supreme Receipts and Rs 1,52,468-0-0 being net gain realised on sales and the redemption of securities							4½% Government of India Loan 1933-00 of the Face Value of Rs 5,600	2,006	0	0			
							5% Government of India Loan 1940-43 of the Face Value of Rs 2,00,000	3 23,500	0	0			
							6% Bombay Municipal Bonds 1954 of the Face Value of Rs 10,000	39,000	0	0			
							6% Rangoon Municipal Debentures 1955 of the Face Value of Rs 3,83,500	4 15,329	2	0			
							4% Karachi Port Trust Bonds 1943 of the Face Value of Rs 80,000	81,800	0	0			
							(Market Value on 31st March 1940 Rs 13,57,360-8-0)	12,42,940	3	0			
							India Treasury Bills of the Face Value of Rs 5,70,000	5,70,304	11	0			
							Fixed Deposits with the Chartered Bank of India, Australia and China	84,000	0	0			
							Current Account with the Imperial Bank of India Bombay	10,07	0	8			
							Imprests — Committee's Account as certified by the Secretary						
							Technical Research Laboratory as certified by the Director of Agricultural Research						
							Director of Agriculture Bombay as certified by the Director of Agriculture						
							(Carriage)	10,00	03	14	8		
											10,00	03	14

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31st MARCH, 1940—(concl'd.)

RECEIPTS.	Rs.	a.	P.	EXPENDITURE.	Rs.	a.	P.	Rs.	a.	P.
Brought forward ..	28,24,592	12	0	.. Brought forward ..	19,00,303	14	8	9,08,105	10	8
				Registrar, Co-operative Societies, and Director of Rural Development, Bombay Province, Poona, as certified by the Registrar, Co-operative Societies ..	Rs. a. p.			580	0	0
				Director of Agriculture, Sind, as certified by the Director of Agriculture, Sind ..	350	0	0			
				Cotton Research Botanist, Lyallpur, as certified by the Cotton Research Botanist, Lyallpur ..	150	0	0			
				Plant Physiologist, Punjab, as certified by the Plant Physiologist, Punjab ..	100	0	0			
				Suspense (Recoverable) ..	3,970	0	0			
				Loan Recoverable (But considered Doubtful) ..	5,860	0	8			
				† Total Closing Balance ..	6,353	2	0			
TOTAL ..	28,24,592	12	0	TOTAL ..	19,16,487	1	4	28,24,592	12	0
				*3½% Government of India Loan 1947-50 of the Face Value of Rs. 1,50,000 have been deposited with the Imperial Bank of India, Bombay, as Security against any overdraft that may be required by the Committee ..						
				† Includes Rs. 12,821-11-0 on account of Sinking Fund.						

We have examined the above Statement of Receipts and Payments of the Indian Central Cotton Committee with the Books, Vouchers and Certified Returns of the Committee, have obtained all the information and explanations we have required and certify that to the best of our information and explanations received, the above Statement is a correct abstract of the figures appearing in the Books and is drawn up in conformity with the Rules under the Indian Cotton Cess Act, 1923.

(Sd.) S. B. BILLIMORIA,
Registered Accountants, Auditors.

BOOMBAY, 24th June 1940.

PROVIDENT FUND ACCOUNT AS AT 31st MARCH, 1940

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5 01,422 1 2

RECEIPTS	Rs a p	Rs a p	EXPENDITURE	Rs a p	Rs a p
Opening Balance as on 1st April 1939	4 53 285 11 5		Balance—		
Less—Payments to subscribers who resigned in 1938 1939	2 012 8 11	4 51 273 2 0	(Securities in Government Papers at Market Value)		
Subscribers Contributions	28 545 0 0		31% Government Promissory Notes of the Face Value of Rs 2 35 400	2 23 777 2 0	
Add—Recoveries against Advances	4 759 6 0	33 304 6 0	31% Government of India Loan, 1917-50 of the Face Value of Rs 1 00 000	1 25 250 0 0	
Less—Refunds to Subscribers who have re signed	15 488 13 2	4 84 577 8 6	4% Government of India Loan 1900-70 of the Face Value of Rs 32 000	35 269 2 0	
Advances to subscribers	5 084 13 0	20 573 10 2	24% Government of India Loan 1918-52 of the Face Value of Rs 70 000	67 937 8 0	
Committee Contributions received from Indian Central Cotton Committee		4 64 003 14 4	Savings Bank Account with the Imperial Bank of India Bombay	4 50 283 12 0	
Less—Payments made to subscribers who have resigned including transfers to Lapsa and Perfidura Account for contributions dis allowed		28 545 0 0	Current Account with the Imperial Bank of India Bombay	9 209 4 0	
Interest received on Investments	16 444 14 0	4 92 548 14 4		39 920 1 2	
Interest received on Advances to Subscribers	124 13 3	15 034 1 3			
Refund of Income Tax deducted on Interest received during 1938 1939	242 1 0				
Less—Interest paid during the year to Subscribers who have resigned — On their own Contributions On Committee a	139 15 10 135 15 6	16 811 12 3			
Interest paid in advance at the time of purchase of Government Securities (since received)	374 13 11				
Income Tax deducted from Interest on Investments (recoverable)	258 5 0				
Carried over	1 409 2 3	16 811 12 3	Carried over		5 01 422 1 2

1 MAJOR HEADS	2 Total sanctioned grant	3 Period	4 Date of starting of the scheme	5 Total expenditure up to 31st March 1940	6 Expenditure from Capital Grants on			8 Expenditure from annual grants on apparatus and equipment of permanent or semi permanent nature and live-stock.	9 Net working expenses of staff field experiments, labour stores, laboratory and field contingencies including petty apparatus	10 REMARKS.
					Rs	a	p			
11 Technological Research — (1) Technological Laboratory — (a) Capital Expenditure (b) Working Expenses (2) Provincial — (a) Capital (b) Working (c) Investigation for improving the spinning of Indian Cottons — Capital working Development of Alternative uses for Indian Cottons — Capital working SEED DISTRIBUTION AND EXTENSION SCHEMES 1 Bombay Province — (i) Hubli (ii) Gadag (iii) Gadag Supplementary (iv) Haveri	Rs 58° 399 3 8 8° 11 0 0 150 1° 0 6 2 30 500 0 0 4 600 0 0 50 000 0 0 40 63 0 0 50 110 0 0 54 545 0 0 21 448 0 0 27 752 0 0	a 3 0 1° 0 6 2 0 0 0 0 0 0 0 0	p 8 0 2 0 0 0 0 0 0 0 0	Rs 58° 360 14 2 23 45 878 15 1 1 57 636 5 0 44 048 8 3 41 700 15 1 20 167 12 4	Rs 4 07 088 14 0 1 74 371 15 8 A 7 515 15 7	a 0 0 A	p 0 8 7	Rs 57 219 8 3 1° 58 12 10 1 48 861 0 4	Rs 22 68 659 6 10 23 210 0 2 44 042 10 3 41 700 15 1 17° 038 5 10	 Schemes closed down on 31st May 1936 Scheme closed down on 10th June 1935 Scheme did not start.

1 MAJOR HEADS.	2 Total sanctioned grant.	3 Period.	4 Date of starting of the scheme.	5 Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		8 Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	9 Net working expenses, i.e., staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	10 REMARKS.
					6 Lands and Buildings.	7 Machinery, apparatus and other movable property.			
(v) Athani	Rs. a. p. 46,757 0 0	5 0	5th April 1932	Rs. a. p. 18,086 1 7	Rs. a. p. ..	Rs. a. p. ..	Rs. a. p. 1,722 15 6	Rs. a. p. 16,363 2 1	Scheme closed down on 31st May 1936. Scheme did not start.
(vi) Balhonga	27,425 0 0	5 0	..	..	..	..	..	..
(vi) Surat .. ..	..	..	..	..	..	..	..	..
(v) 1027 A. L. F. ..	1,18,410 0 0	13 0	1st April 1930	74,915 14 10	..	..	..	74,915 14 10
(b) Selection 1A. Cotton ..	7,272 0 0	3 0	1st Feb. 1940	404 0 0	404 0 0	
(viii) Khandesh (Banilla) ..	{ 2,70,340 0 0 20,787 0 0	{ 5 0 1 0	{ .. 1st May 1931	1,61,803 5 6	9,032 14 0	1,52,830 7 6	Receipts amounting to Rs. 1,10,000 anticipated in the scheme. The grant of Rs. 20,787 for the extended period takes into account anticipated receipts amounting to Rs. 6,000. This scheme closed down on the 30th April 1937.
(ix) Khandesh (Jarila) ..	A. 24,828 0 0 77,297 0 0	{ 1 10 3 0	1st May 1937	37,504 6 6	..	2,970 0 0	605 12 6	33,928 10 0	
(x) Deccan Canals (Banilla) ..	B 24,465 0 0 1,313 0 0	{ 5 0 5 0	1st Apr. 1934	2,859 3 4	..	..	111 1 6	2,748 1 10
(xi) B D. S.	47,501 0 0	8 0	1st Dec. 1935	17,152 3 0	..	..	217 9 6	16,931 0 4
									A. Excludes anticipated receipts amounting to Rs. 6,500. B. The scheme was expected to be self-supporting but due to low prices the full receipts anticipated were not realised.

-- STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE GOVERNMENT										
1	2	3	4	5	6		7	8	9	10
					Expenditure from Capital Grants on					
MAJOR HEADS	Total sanctioned grant	Period	Date of starting of the scheme	Total expenditure up to 31st March 1940	Lands and Buildings	Machinery apparatus and other movable property	Rs a p	Rs a p	Rs a p	REMARKS
(1) Revised Jaywant and Gadag No 1	Rs a p C 266 772 0 0 D 10 084 0 0 0	5 0 1 0 1 0	1st June 1936	1 00 576 12 4 3 00 601 14 9			196 1 6 03 6 0 14 1 0 0	10 410 10 10 3 063 8 0 06 10 0		C This grant is subject to the condition that the Bombay Govt bears 25% of the net cost calculated after deducting total savings under the Hyderabad and Ballon schemes
(2) Maintenance of nucleus of pure seed of improved varieties of cotton	13 300 0 0	5 0	Sept 1937	5 645 6 9						D The Committee bears 15% of the cost of scheme during extension period (Oct of Bombay sanction to the extension awaited)
2 Madras --										
(a) Pay and allowance of Business Manager Tiruppur	21 040 0 0	6 4	18th May 1931	21 070 13 0			16 4 0	23 917 9 0		E Scheme closed down on 17th Aug 1937 and recommenced from 19th Oct 1938 for one year's extension
(b) Co 2	{ E 81 310 0 0 63 357 0 0 }	{ 6 0 4 5 }	15th Sept 1930	41 286 3 3			83 13 0	41 002 6 3		F Scheme closed down on 17th Aug 1937 and recommenced from 19th Oct 1938 for one year's extension
(40) II 1	18 860 0 0	2 0	6th May 1933	3 900 2 9						G Scheme closed down on 16th July 1934
(41) Maintenance of nucleus of pure seed of improved varieties of cotton	3 050 0 0	5 0	10th Sept 1938	1 153 5 3						
3 Punjab -- Lyalpur Ginnery	18 105 0 0			16 038 3 3	0 201 5 0	6 816 14 3				

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31st MARCH, 1940—(contd.)

MAJOR HEADS.	Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940.	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of permanent or semi-permanent nature and live-stock.	Net working expenses, i.e., staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus.	REMARKS.
					Lands and Buildings.	Machinery, apparatus and other movable property.			
1.	2	3	4	5	6	7	8	9	10
4. <i>Sind</i> :—	Rs. a. p.	Yrs. Mths.		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	F. The Committee bears 15% of the cost of the scheme during the extension for 5 years.
(i) Seed Distribution and Extension Scheme.	4,34,302 0 0	10 0		3,79,013 2 0	..	..	..	3,79,013 2 0	
	F 42,471 0 0	5 0	1st April 1931	5,000 0 0	..	..	2 0 0	4,003 0 0	
(ii) Maintenance of nucleus of pure seed of improved varieties of cotton.	12,500 0 0	5 0	1st April 1938	..	..	..	..	..	Not yet started.
(iii) Financing of Seed Distribution.	1,35,000 0 0	3 0	..	..	..	..	..	..
5. <i>Central Provinces & Berar</i> :—	7,000 0 0	5 0	April 1939	1,400 0 0	..	..	1 2 0	1,398 14 0	
Maintenance of nucleus of pure seed of improved strains of cotton.									
6. <i>Hyderabad</i> :—	35,466 0 0	6 6	1st March 1930.	48,346 5 3	..	..	..	P 48,346 5 3	G. The amount represents the Committee's share of expenditure which is borne on 50: 50 basis between the Hyderabad State and the Committee.
Seed Distribution and Extension Scheme.	G 25,799 0 0	4 6		18,821 11 7	..	..	446 12 0	18,374 15 7	P. Provisional figure.
7. <i>Baroda</i> :—	55,488 0 0	10 0	16th April 1934	2,009 0 0	..	..	..	2,009 0 0	
(i) Navsari Seed Storage Scheme.									
(ii) B. D. 8	17,300 0 0	5 0	1st April 1939		..	..	..

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31st MARCH, 1940—(contd.)

1	MAJOR HEADS	2	3	4	5	Expenditure from Capital Grants on		8	9	10
						Lands and Buildings	Machinery, apparatus and other movable property			
		Rs a p Yrs. Mths	Period	Date of starting of the scheme	Total expenditure up to 31st March 1940	Rs a p	Rs a p	Rs a p	Net working expenses of staff field experiments, labour stores, laboratory and field contingencies including petty apparatus	REMARKS
8.	United Provinces—C 402	45 800 0 0	5 0	1st May 1935	18 617 7 6	Rs a p	Rs a p	Rs a p	19 317 7 6	Scheme closed down on 15th February 1938.
B MARKETING SCHEMES										
1.	Central Provinces and Bihar									
(i)	Verum Cotton	1 17 900 0 0	3 8	1st Sept 1930	73 544 2 5				73 544 2 5	Scheme closed down on 30th April 1934
(ii)	Extension and Marketing of V 434 Cotton	2 18 819 0 0 33 725 0 0 71 678 0 0	5 2 21 3 0 3 0	1st April 1934	2 03 58 8 2			330 0 0	6 6 472 10	
(iii)	Distribution and marketing of Bari 107 cotton in Bikanpur Tehsil	15 300 0 0	3 0	Apr 1 1939	5 698 0 0				5 698 0 0	

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE											
MAJOR HEADS	Total sanctioned grant	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live stock.	Net working expenses, i.e., staff, field experiments, laboratory stores, and field contingencies including petty apparatus.	REMARKS		
					Lands and Buildings.	Machinery, apparatus and other movable property.					
										Rs.	a. p.
1	Rs.	a. p.	Yrs. Mths.	3	4	5	6	7	8	9	10
1. Disbursal of Cotton Seed— (a) Recurring (b) Non Recurring	5 250 0 0 } 3 700 0 0 } 42 924 0 0 7	0 0 } 0 0 } 0 0 7	3 0 } 3 0 } 7 0	0 1st Feb 1936 0 March 1934							
11. Plant Puller Propaganda in Surat, Broach and Panch Mahals Districts.	14 933 0 0	0 0	5 7	1st April 1937							
12. Breeding of Wilt Resistant Cotton for Surat Area	42 150 0 0	0 0	5 0	1st April 1937							
13. Cotton Wilt Breeding scheme, Lucas.	7 908 0 0	0 0	4 0	1st June 1937							
14. Inclusion of Northern and Western Cottons in Programme of Dry Farming scheme, Bilapur.	40 059 0 0	0 0	5 0	1st Nov. 1938							
15. Inter specific Hybridisation in cottons at Surat.	13 880 0 0	0 0	5 0	Not started.							
16. Improvement of Cotton crop in Kakra District.	27 110 0 0	0 0	5 0	1st May 1937							
17. Improvement of Dholeras Cottons Wagad cotton at Vrangam	2 456 0 0	0 0	3 0	Not started.							
18. Model Project for extension of cotton in Kakra District.	1 423 0 0	0 0	2 0								
This continuation scheme is financed partly from the savings of the Scheme. Clean up scheme. A Provisional figure.											
B Subject to Govt. of India sanction.											

This continuation scheme is financed partly from the savings of the Surat Clean up scheme. A Provisional figure.

Subject to Govt. of India sanction.

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31st MARCH, 1940--(contd.)

MAJOR HEADS.	1	Total sanctioned grant.	2	Period.	3	Date of starting of the scheme.	4	Total expenditure up to 31st March, 1940	5		Expenditure from Capital Grants on		8	9	10	REMARKS.	
									Rs.	a. p.	Rs.	a. p.					
																	Lands and Buildings.	Machinery, apparatus and other movable property.
Madras :—																	
(a) Herbaceum	1,47,068	0 0	14	6	1st Dec. 1923		1,42,406	13	1	1,431	7 0	1,33,035	6 1	Scheme closed down on 31st May 1938.
(b) Pemphres and Physiological.	..	2,12,779	0 0	10	0	10th Sept. 1931		1,75,215	0	11	..	..	8,032	6 10	1,67,163	3 1
(c) Fodder Cholam :—																	
(i) Capital	900	0 0	6	5	14th Jan. 1931		19,517	0	4	..	881	11 7				Scheme closed down on 14th June 1937.
(ii) Recurring	21,010	0 0								..	..	291	3 4	19,314	10 5	
(d) Breeding of Nadam Cotton	..	18,203	0 0	8	0	14th June 1933		15,100	5	1	..	..	123	14 9	14,784	6 4
(e) Improvement of Mungari Cotton.	..	23,534	0 0	5	0	24th May 1937		11,080	14	10	..	..	117	2 11	10,969	11 11
(f) Improvement of Cocanadas Cotton.	..	35,309	0 0	5	0	1st Feb. 1940		727	0	0	2	0 0	725	0 0	Scheme closed down on 31st March 1938.
(g) Investigation of possibilities of Control of Cotton Stem Weevil of South India.	..	5,500	0 0	1	0	30th Oct. 1930		2,400	0	0	..	..	70	5 0	2,323	11 0
Punjab :—																	
(a) Botanical :—																	
(i) Capital	31,330	0 0	20	71	13th Aug. 1925		5,71,287	3	8	22,158	0 0	9,102	11 0			Rs. 2,030 transferred to Capital.
(ii) Working Expenses	7,98,268	0 0									5,826	3 10	35,074	4 5	5,04,652		1 3
(b) Entomological :—																	
(i) Capital	6,000	0 0	11	11	14th May 1926		2,25,008	7	11	..	5,826	3 10				Scheme closed down on 31st March 1938.
(ii) Working Expenses (Pink and Spotted Heliothorm.)	..	2,49,646	0 0									6,307	4 11	2,13,711		15 2

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31st MARCH, 1940—(contd.)

FINANCED BY THE COMMITTEE UP TO 31st MARCH, 1940—(contd.)												
MAJOR HEADS.		Total sanctioned grant.	Period.	Date of starting of the scheme.	Total expenditure up to 31st March, 1940	Expenditure from Capital Grants on		Expenditure from annual grants on apparatus and equipment of a permanent or semi-permanent nature and live-stock.	Not working expenses, viz. staff, dead animals, men's labour, stores, laboratory and field consignments including petty apparatus.	REMARKS.		
1	2					6	7					
	Rs.	a. p.	Yrs.	Mths.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	10	
Central Provinces and Berar :—ctd.												
(c) Entomological	13,131	0 0	3	3	2nd July 1934	12,314 13 0	..	..	59 10 0	12,255 1 0	Scheme closed down on 30th Sept. 1937.
(d) Investigation of Heliothis Obsolete.	3,000	0 0	1	5	25th June 1939	959 0 0	..	..	116 14 3	842 1 0	
(e) Model Projects for extension of improvements in cultivation of crops. ..	† 2,298	0 0	3	0	Not started	..	..	..	..	..
Sind :—												
(a) Physiological	2,74,346	0 0	11	4	10th July 1927	2,03,915 12 10	..	..	..	..	Subject to Govt. of India's sanction.
(b) Jassid Investigation ..	11,261	0 0	3	6	9th May 1938	5,500 12 1	..	..	17,370 11 0	2,46,375 1 1	Scheme closed down on 39th June 1937.
(c) Investigation into Black-headed cricket. ..	13,980	0 0	3	0	30th Sept. 1938	5,080 10 8	..	..	107 11 0	5,393 1 1	
(d) Cotton Breeding Investigation for the production of long staple cottons for cultivation in Sind.	2,21,140	0 0	5	0	10th April 1940	817 2 3	..	..	..	4 5,679 10 8	Provisional figures.
(e) Boll-worm Investigation and clean-up campaign.	85,900	0 0	3	0	1st Sept. 1940	..	..	..	..	817 2 3	
United Provinces :—												
(a) Pink Boll-worm :—												
(i) Capital	54,000	0 0	8	0	July 1923	1,46,834 1 4	..	..	..	..	Scheme closed down on 31st July 1931.
(ii) Working Expenses ..	56,000	0 0										
(iii) Recurring grant for staff.	44,475	0 0										
			7	9½	1st Oct. 1920		..	..	3,065 4 3	95,257 7 7	Scheme closed down on 12th July 1934.

STATE SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31st MARCH, 1910—(contd.)

MAJOR HEADS.	1	Total sanctioned grant.	2	Period.	3	Date of starting of the scheme.	4	Total expenditure up to 31st March, 1910.	5	Expenditure from Capital Grants on			Remarks.
										6	7	8	
										Rs. a. p.	Rs. a. p.	Rs. a. p.	
<i>Hyderabad :—</i>													
(a) Botanical	4,02,000	0 0	14 11	10th May 1929			3,12,033	3 8	..	..	20,174 12 10	3,21,853 6 10
(b) Cotton Survey	30,165	0 0	5 0	28th June 1931			30,578	3 0	..	..	157 11 10	30,390 7 2
(c) Pink and Spotted Boll-worm and Clean-up campaign.		1,51,018	0 0	7 10	1st June 1933			1,20,106	1 10	..	..	..	..
(d) Improvement of Kumpta Cotton.		32,542	0 0	5 0	28th Nov. 1937			14,011	15 7	..	..	..	..
(e) Inclusion of Northern and Westerns in programme of Dry Farming Research, Raichur.		1,723	0 0	4 0	1st Sept. 1937			1,005	0 0	..	..	..	..
(f) Improvement of Cottons off the Oomra tract.		60,412	0 0	5 0	Not started			..	..	..	..	..	..
<i>Baroda :—</i>													
(a) Root Rot :—													
(i) Capital	4,000	0 0	10	4	1st Feb. 1932		70,787	14 7	..	..	12,374 0 7	61,113 14 0
(ii) Recurring Expenses	91,569	0 0					4,251	5 3	..	..	115 11 6	4,105 9 9
(b) Comparative tests of 1027 A. L. F. and 1A Cottons.		4,280	0 0	1	2	1st April 1932		3,472	7 0	..	..	..	3,472 7 0
(c) Survey of Goghari Cotton		5,000	0 0	5	0	1st Feb. 1935		24,088	7 9	..	..	585 14 0	23,502 9 9
(d) Plant Puller Propaganda	41,853	0 0	6	0	1st Jan. 1936		9,764	0 4	..	..	811 14 4	8,952 2 0
(e) Improvement of Dholleras Cottons-Mathia cotton at Anreli and Jagudan.		21,570	0 0	5	0	4th June 1937							

† Subject to Govt. of India's sanction.

Scheme closed down on 15th June 1933.

Scheme closed down on 31st May 1938.

STATEMENT SHOWING EXPENDITURE ON THE SCHEMES FINANCED BY THE COMMITTEE UP TO 31st MARCH, 1940—(contd.)

MAJOR HEADS	Total sanctioned grant	Period.	Date of starting of the scheme	Total expenditure up to 31st March, 1940	Expenditure from Capital Grants on			Expenditure from annual grants on apparatus and equipment of a permanent or semi permanent nature and live stock	Net working expenses for staff, field experiments, labour, stores, laboratory and field contingencies including petty apparatus	REMARKS
					Lands and Buildings	Machinery, apparatus and other movable property.				
1	2	3	4	5	6	7	8	9	10	
Bikaner —										
Bengala Cotton Improvement (i) Capital	14 500 0 0	10 0	1st Jan 1931	57,190 5 2	8,584 0 0	3,835 5 0	..	..	..
(ii) Working	65 350 0 0	5 0		..	..	..	1,903 0 0	43,510 3 5		
	15 821 0 0	0 0		..	..	..	97 3 0	10,953 0 0		
Mysore (Dodd Balli) Cotton	18,416 0 0	0 0	1st Nov 1935	11,050 3 0	..	..	..	..
Cutch —										
Improvement and development of Cotton	40 700 0 0	5 0	Not started	..	..	..	..	..
Collection of Herbaceous Cottons in Iran	4,000 0 0	0 0	31st Aug 1936	3,144 3 0	..	..	..	3,144 3 0		
Improvement of Dholeras Cottons Preliminary trials at Nawasagar	900 0 0	0 4	1st June 1930	323 12 4	..	..	..	323 12 4		
Estimation of effects on Cotton crop of use of Plant Pullers	4 738 0 0	2 0	1st Dec 1930	4 143 12 5	..	..	2 4 0	4,141 8 5		Scheme closed down on 31st May 1939
Marketing Schemes —										
(a) Marketing of 1927 A. L. F. Cotton of Baroda State.	1,910 0 0	5 0	1st Feb 1938	3,612 14 10	..	..	..	3,612 14 10		
(b) Cotton Marketing Survey in the Punjab.	7,634 0 0	1 3	16th Sept 1938	7,323 2 3	..	..	70 9 0	7,243 0 3		Scheme closed down on 15th February 1940

APPENDIX III.

Revised Trade Classification of Indian Cottons.

Trade Descriptions.

Tracts included.

I. BENGALS.—

- (1) U. P. Deshi United Provinces (including Rampur State), Delhi, Bihar, Orissa [excluding the districts of (i) Koraput and (ii) Ganjam (other than the Khondmals)], Bundelkhand Agency of Central India, Rewa State of Central India Residency (Indore), and Western Bengal (Bankura and Midnapore districts).
- (2) Punjab Deshi Punjab (including Indian States except Khairpur State) and North-West Frontier Province).
- (3) Sind Deshi .. Sind (including Khairpur State).
- (4) Rajputana Deshi. Ajmer-Merwara and Rajputana States (excluding Jhalwar and Partabgarh States and Sironj, Chhabra and Pirawa parganas of Tonk State).

II. AMERICANS

- (1) Sind-American Sind (including Khairpur State).
- (2) Punjab-American. Punjab (including Indian States except Khairpur State).
- (3) Buri .. Burhanpur *tahsil* of Nimar district of Central Provinces.

III. OOMRAS—

- (1) C.P. Oomras Central Provinces (excluding Nimar district); and Yeotmal district of Berar.
- (2) Berar Oomras Berar (excluding Yeotmal district).
- (3) Nimar Oomras Nimar district of Central Provinces.
- (4) C.P. and Berar Central Provinces and Berar.
Verum.
- (5) Khandesh Oomras. Nasik, East Khandesh (excluding Amalner taluka) and West Khandesh (excluding Nawapur and Shirpur talukas) districts of Bombay Province.
- (6) Khandesh Banilla. Amalner taluka of East Khandesh district and Shirpur taluka of West Khandesh district of Bombay Province.
- (7) Barsi-Nagar Oomras. Ahmednagar, Poona and Sholapur districts of Bombay Province and Akalkot State.

Trade Descriptions	Tracts included.
III OOMRAS—(contd)	
(8) Hyderabad Oomras	Aurangabad, Bir (excluding Mominabad taluka), Farblani, Adilabad (excluding Nirmal taluka) Osmanabad (excluding the protected tract included under 'Hyderabad Gaorani') and Nizamabad districts of Hyderabad State
IV HYDERABAD GAORANI	The Hyderabad Gaorani Protected Area of Hyderabad State comprising the districts of Nander and Bidar, part of Osmanabad district Nirmal taluka of Adilabad district and Mominabad taluka of Bir district
V. CENTRAL INDIA—	
(1) Malvi (2) Central India —Others	} Gwahar State Indore State Bhopal Agency and Malwa Agency of Central India, Jhalawar and Partabgarh States and Sironj Chhabra and Pirawa parganas of Tonk State of Rajputana
VI BROACH	Kaira district and Broach and Panch Mahals district (excluding Ankleshwar taluka) of Bombay Province, certain States* in the Gujarat States Agency and Baroda district of Baroda State
VII SURTI	Ankleshwar taluka of Broach and Panch Mahals district, Surat district and Nawapur taluka of West Khaneshi district of Bombay Province, Rajpipla Sachin, Bansda and Dharampur States of the Gujarat States Agency and Navsari district of Baroda State
III DHOLLERAS —	
(1) Gujarat—Dhollerias	"Wagad," "Laho" and other staple cottons grown in Ahmedabad district of Bombay Province, Mehsana district of Baroda State and in part of Western India States Agency
(2) Gujarat—Short Staple	Short staple cottons grown in part of Western India States Agency
(3) Kathiawar—Dhollerias	"Wagad," "Kala" and other staple cottons grown in part of Western India States Agency
(4) Kathiawar—Short staple	"Mathia" and other short staple cottons grown in part of Western India States Agency and in Amreli district of Baroda State
(5) Cutch Dhollerias	Cutch State

* Including Balasnor, Baria, Cambay, Chota Udepur, Lunawada, Sant, Jambugoda, Mandwa, Vajira and Bhaderwa

APPENDIX III.

Revised Trade Classification of Indian Cottons.

Trade Descriptions.	Tracts included.
---------------------	------------------

I. BENGALS.—

- | | |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) U. P. Deshi | United Provinces (including Rampur State), Delhi, Bihar, Orissa [excluding the districts of (i) Koraput and (ii) Ganjam (other than the Khondmals)], Bundelkhand Agency of Central India, Rewa State of Central India Residency (Indore), and Western Bengal (Bankura and Midnapore districts). |
| (2) Punjab Deshi | Punjab (including Indian States except Khairpur State) and North-West Frontier Province). |
| (3) Sind Deshi .. | Sind (including Khairpur State). |
| (4) Rajputana Deshi.
: . . . | Ajmer-Merwara and Rajputana States (excluding Jhalawar and Partabgarh States and Sironj, Chhabra and Pirawa parganas of Tonk State). |

II. AMERICANS

- | | |
|----------------------|-----------------------------------------------------------------|
| (1) Sind-American | Sind (including Khairpur State). |
| (2) Punjab-American. | Punjab (including Indian States except Khairpur State). |
| (3) Buri .. | Burhanpur <i>tahsil</i> of Nimar district of Central Provinces. |

III. OOMRAS—

- | | |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| (1) C.P. Oomras | Central Provinces (excluding Nimar district); and Yeotmal district of Berar. |
| (2) Berar Oomras | Berar (excluding Yeotmal district). |
| (3) Nimar Oomras | Nimar district of Central Provinces. |
| (4) C.P. and Berar Verum. | Central Provinces and Berar. |
| (5) Khandesh Oomras. | Nasik, East Khandesh (excluding Amalner taluka) and West Khandesh (excluding Nawapur and Shirpur talukas) districts of Bombay Province. |
| (6) Khandesh Banilla. | Amalner taluka of East Khandesh district and Shirpur taluka of West Khandesh district of Bombay Province. |
| (7) Barsi-Nagar Oomras. | Ahmednagar, Poona and Sholapur districts of Bombay Province and Akalkot State. |

Trade Descriptions

Tracts included.

III OOMRAS—(contd)

(8) Hyderabad
OomrasAurangabad, Bir (excluding Mominabad taluka), Par
bhani, Adilabad (excluding Nirmal taluka), Osman
abad (excluding the protected tract included under
'Hyderabad Gaorani') and Nizamabad districts of
Hyderabad StateIV HYDERABAD
GAORANIThe Hyderabad Gaorani Protected Area of Hyderabad
State comprising the districts of Nander and Bidar
part of Osmanabad district Nirmal taluka of Adil
abad district and Mominabad taluka of Bir district

V CENTRAL INDIA—

(1) Malwa

(2) Central India
—OthersGwalior State Indora State Bhopal Agency and Malwa
Agency of Central India Jhalawar and Partabgarh
States and Sironj Chhabra and Pirawa parganas of
Tonk State of Rajputana

VI BROACH

Kaira district and Broach and Panch Mahals district
(excluding Anleswar taluka) of Bombay Province,
certain States* in the Gujarat States Agency and Baroda
district of Baroda State

VII SURTI

Ankleshwar taluka of Broach and Panch Mahals dis
trict, Surat district and Navapur taluka of West Khan
desh district of Bombay Province Rajpipla Sachin,
Bansda and Dharampur States of the Gujarat States
Agency and Navsari district of Baroda State

VIII DHOLLERAS —

(1) Gujarat—
Dholleras"Wagad," "Laho" and other staple cottons grown
in Ahmedabad district of Bombay Province, Mehsana
district of Baroda State and in part of Western India
States Agency(2) Gujarat—
Short StapleShort staple cottons grown in part of Western India
States Agency(3) Kathiawar—
Dholleras"Wagad," "Kala" and other staple cottons grown in
part of Western India States Agency(4) Kathiawar—
Short staple"Mathia" and other short staple cottons grown in part
of Western India States Agency and in Amreli district
of Baroda State(5) Cutch
Dholleras

Cutch State

* Including Balasamor, Baria, Cambay, Chota Udepur Lunawada, Sant, Jambugoda
Asdana, Mandwa, Vajuria and Bhaderwa

Trade Descriptions.

Tracts included.

IX. SOUTHERNS.—

- (1) Kumpta and Upland. Dharwar, Belgaum and Satara districts of Bombay Province; Satara Jagirs; S. M. C. States; Mysore State (excluding Mysore and Bangalore districts); and Raichur Protected Area in Raichur district of Hyderabad State.
- (2) Bijapur and Bagalkot Jowari. Bijapur district of Bombay Province.
- (3) Westerns .. Bellary, Anantapur and Cuddapah districts and Pattikonda taluka of Kurnool district of Madras Province; Raichur district (excluding the Raichur Protected Area) and Gulbarga district of Hyderabad State.
- (4) White and Red Northern. Kurnool district (excluding Pattikonda taluka but including Banganapalle State) of Madras Province.
- (5) Warangal and Cocanadas. Nellore, Guntur, Kistna, East Godavari and West Godavari districts and Golconda taluka of Vizagapatam district of Madras Province; Warangal, Karimnagar, Nalgonda, Mahboobnagar, Atrasibalda and Medak districts of Hyderabad State.
- (6) Chinnapathi (Short-staple). Ganjam (excluding the Khondmals) and Koraput districts of Orissa; and Vizagapatam (excluding Golconda taluka) district of Madras Province.

X. TINNEVELLIES.—

- (including Karungannies). Coimbatore, Madura, Ramnad and Tinnevely districts of Madras Province.

- XI. CAMBODIAS .. North Arcot, South Arcot, Coimbatore, Salem, Trichinopoly (including Pudukkottai State), Madura, Ramnad, Tinnevely, Chittoor and Chingleput districts of Madras Province.

- XII. SALEMS South Arcot, Coimbatore, Salem, Trichinopoly, Tanjore, Malabar and South Kanara districts of Madras Province; and Mysore district of Mysore State.

- XIII. COMILLAS Assam; and Eastern Bengal (Mymensingh and Chittagong Hill Tracts districts and Tripura State).
-

APPENDIX IV.
INDIAN RAW COTTON CONSUMED IN INDIAN MILLS
 returns from mills in Indian States)
Cotton Year 1st September to 31st August
 (In Bales of 400 lbs nett)

	19'5 26	19'0 27	1927 28	1928 29	19'9 30	1930 31	1931 32	1932 33	1933 34	1934-35	1935-36	1936-37	1937 38	1938 39	1939 40
Bombay Island	31 93	747 988	435 426	542 036	706 375	664 546	611 606	565 034	491 709	637 937	604 109	636 729	722 815	700 317	631 149
Ahmedabad	286 800	264 139	998 075	318 933	344 021	321 503	322 257	348 009	373 315	329 558	320 082	304 399	346 269	346 375	305 459
Bombay Province	1 189 539	1 167 892	894 671	1 044 925	1 300 859	1 173 639	1 139 645	1 116 29	1 063 549	1 230 610	1 189 310	1 128 741	1 353 928	1 310 313	1,172 283
Madras Province	176 274	185 207	194 591	204 284	211 483	214 739	260 70	299 013	278 080	312 164	363 493	412 268	492 573	480 839	507 085
United Provinces	191 740	904 702	170 846	189 462	234 903	233 093	256 870	273 573	27 230	29 124	31 011	299 073	283 329	366 331	349 340
Central Provinces, and Berar	109 993	111 992	116 838	121 391	123 146	118 492	113 018	111 905	112 660	123 014	130 298	122 987	146 567	164 616	149 863
Bengal	77 949	89 763	82 086	84 212	99 075	91 993	102 390	103 784	107 632	101 101	99 892	79 944	99 546	90 611	101 078
The Punjab and Delhi	35 394	40 637	43 638	54 573	64 464	78 736	89 631	80 854	71 939	83 897	80 430	93 886	94 742	133 317	141 234
Rest of British India	17 318	13 100	15 040	22 189	24 458	27 101	30 342	31 935	33 139	38 575	38 010	35 823	40 840	49 806	44 807
Total—British India	1 798 204	1 812 733	1 519 760	1 714 035	2 057 695	1 935 393	1 987 603	2 009 664	1 940 210	2 183 791	2 098 374	2 172 725	2 445 606	2 591 863	2,461 757
Total—Indian States*	187 614	229 443	251 589	277 540	315 399	333 996	358 793	351 200	380 116	498 341	449 314	400 000	554 003	559 209	565 387
TOTAL—INDIA	1 985 818	2 042 176	1 771 349	1 991 578	2 373 094	2 269 359	2 346 396	2 360 864	2 320 326	2 682 132	2 547 688	2 572 725	3 045 609	3 151 072	3 017 144

* Figures for Indian States up to and including 1930-31 being based on yarn production returns include foreign cotton also
 † From April 1931 figures for Burma have been excluded

INDIAN RAW COTTON CONSUMED IN MILLS IN INDIAN STATES. (Based on voluntary returns from mills in Indian States).

Cotton Year : 1st September to 31st August.
(In Bales of 400 lbs. nett.)

	1926-27	1927-28	1928-29	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40
Hyderabad	15,210	16,097	19,067	20,823	23,074	31,200	33,188	33,231	45,588	51,771	49,931	63,093	68,156	67,995
Mysore	43,571	44,320	39,610	40,500	43,326	40,293	50,537	47,108	51,106	50,824	53,236	55,214	53,853	67,710
Baroda	40,070	46,884	48,862	50,013	52,578	58,531	50,587	53,612	57,116	51,063	51,761	70,636	73,278	65,573
Gwalior	24,257	25,716	36,708	41,463	45,207	45,892	43,306	49,362	50,318	72,163	79,070	80,243	91,000	88,688
Kanharav States	53,520	66,301	70,070	83,026	88,020	95,290	91,036	111,430	114,220	113,379	106,154	147,769	140,792	120,186
Other Indian States	40,800	52,581	57,221	61,454	29,283	18,810	18,868	20,506	35,438	37,397	42,717	48,545	41,109	52,333
Pondicherry					20,257	30,382	40,300	45,197	45,735	51,162	57,767	57,110	58,114	
Total—Indian States	220,443	251,580	277,540	315,390	333,000	358,793	351,200	390,116	428,311	449,314	460,000	554,003	559,202	555,387
														102,702

LOOSE (UNPRESSED) INDIAN RAW COTTON RECEIVED IN SPINNING MILLS IN BRITISH INDIA. (Based on voluntary returns furnished by mills.)

Cotton Year : 1st September to 31st August.
(In Bales of 400 lbs. nett.)

	1926-27	1927-28	1928-29	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40
Bombay Province	28,328	24,070	27,324	24,301	51,409	71,079	80,002	71,808	58,355	75,017	67,210	71,750	80,161	80,687
Madras Province	35,198	30,560	52,188	46,682	55,717	90,380	90,340	110,875	123,200	147,014	173,102	156,075	162,480	175,510
United Provinces	16,001	10,308	13,878	20,441	18,496	14,367	19,236	17,871	10,000	10,405	10,050	15,710	17,532	20,270
Central Provinces and Berar	40,702	20,801	6,924	16,243	15,771	20,743	17,462	18,382	20,514	27,502	26,321	32,860	26,980	20,052
Bengal*														
The Punjab and Delhi†	3,910	4,730	3,700	4,361	4,307	2,317	2,140		5,535	3,110	90	23,875	25,000	22,810
Rest of British India*														
Total—British India	125,180	100,438	104,074	111,088	148,700	211,705	215,279	221,900	217,781	263,076	325,058	321,037	336,041	317,135
Indian States*											131,140	100,003	122,078	116,893
Total—INDIA*											456,207	430,040	458,110	401,028

* Figures up to 1935-36 not compiled.

† From 1926-37 the figures refer to consumption and not receipts and are based on returns furnished under the Indian Cotton Cess Act, 1923, by mills in British India and voluntary returns from mills in Indian States. From April 1937 onwards for Burma have been excluded.

by mills in British India and

APPENDIX V.

STOCKS OF INDIAN RAW COTTON HELD IN INDIA BY THE MILLS AND THE TRADE ON 31st AUGUST, 1939 AND 1940 (In thousand bales * of 400 lbs each)

Trade Descriptions of Cotton.	TRADE STOCKS ON 31st AUGUST								Mill Stocks on 31st August		Total Trade and Mill Stocks on 31st August	
	Bombay Island		Karachi		Rest of India		Total India.		Total India.			
	1939	1940	1939	1940	1939	1940	1939	1940	1939	1940	1939	1940
BEGGALS--												
U P Deshl	—	—	—	1	(a) 12	(a) 6	12	7	37	41	49	48
Punjab Deshl	—	—	51	74	(b) 3	(b) 3	51	77	23	27	70	101
Sind Deshl	—	—	6	20	—	—	6	20	1	1	7	21
Rajputana Deshl	—	—	—	—	—	—	—	—	14	9	14	9
Unclassified	29	22	4	2	—	—	33	24	5	—	38	2
Total	29	22	61	97	15	9	105	128	82	78	187	206
AMERICANS--												
Sind Sudhar (230 F 1)	24	8	3	1	—	—	27	9	19	19	46	28
Sind (Unspecified & 4 F 93)	3	4	13	18	(d) 1	—	17	22	23	24	40	46
Punjab-250-k	26	4	7	9	(b) 1	(b) 1	36	18	67	56	124	96
Punjab-L. S. 8	—	—	1	3	(b) 1	(b) 1	—	—	21	21	—	—
Punjab (Unspecified 4F)	4	8	14	91	(b) 8	(b) 5	26	101	172	113	198	317
Bari	—	—	—	—	—	—	—	—	—	1	1	1
Dharwar (Gadag 1)	—	—	—	—	(e) 7	(e) 5	7	5	6	3	12	8
Dharwar (Upland Unspecified)	—	—	—	—	—	(m) 11	—	11	6	3	6	14
Cambodia Co.	—	—	—	—	—	—	—	—	46	40	46	40
Cambodia (Unspecified)	1	—	—	—	(f) 31	(f) 39	32	39	15	18	47	57
Total	58	24	38	122	49	62	145	209	374	299	519	507
OMRAS--												
C. F. and Nimar Omras	8	41	—	—	(g) 6	(g) 25	14	66	13	41	27	107
Betar Omras	14	66	—	—	(h) 16	(h) 38	30	104	20	22	56	126
C. F. & Betar Verum	—	—	—	—	—	—	—	—	13	27	13	27
Khandesh Omras	17	25	—	—	(i) 4	(i) 6	21	31	15	11	36	42
Khandesh Banilla	—	—	—	—	—	—	—	—	16	8	16	8
Betar Nagar Omras	—	—	—	—	—	—	—	—	—	12	—	—
Hyderabad Omras	14	35	—	—	(j) 46	{31}	60	66	9	{22}	69	100
Total	53	167	—	—	72	100	120	267	92	143	217	410
HYDERABAD GAORANI	—	1	—	—	(j) 18	(j) 4	18	5	42	43	60	48
CENTRAL INDIA--												
Marl	—	—	—	—	(L) 2	—	2	—	28	17	30	17
Central India—Others	11	21	—	—	(L) 34	(L) 38	45	58	12	16	57	75
Total	11	21	—	—	36	38	47	58	40	33	87	92
BROAD	45	119	—	—	(d) 7	(d) 17	52	136	44	63	96	199
SCRTI	42	39	—	—	—	—	42	39	59	49	101	88
DHOLLERAS--												
Gujarat-Dholleras	—	—	—	—	(c) 9	(c) 6	61	23	42	{16}	{103}	54
Gujarat-Short staple	52	17	—	—	—	—	—	—	—	6	—	—
Kathlawar Dholleras	—	—	—	—	—	—	4	5	4	2	8	7
Kathlawar-Short staple	4	5	—	—	—	—	—	—	1	—	1	—
Cutch Dholleras	—	—	—	—	—	—	—	—	—	—	—	—
Total	56	22	—	—	9	6	65	28	47	33	112	61
SORTERS--												
Kumlas Jayawant	—	—	—	—	(m) 8	(m) 10	8	10	36	33	44	47
Kumlas (Unspecified)	37	6	—	—	(n) 1	(n) 5	38	11	29	41	68	52
Bijapur and Bagalkot Jowari	—	—	—	—	(r) 60	(r) 67	101	76	97	{39}	{198}	136
Western	41	9	—	—	—	—	—	—	—	12	—	—
White & Red Northern	—	—	—	—	(f) 14	(f) 21	14	21	10	6	24	27
Warangal and Cocanada	—	—	—	—	—	—	—	—	—	—	—	—
Chinnapathi (Short staple)	—	—	—	—	83	103	161	118	173	140	334	258
Total	78	15	—	—	—	—	—	—	—	—	—	—
TINNEVELLIES (including Karungannies)	—	—	—	—	(f) 26	(f) 25	—	25	25	25	51	50
Tinnevelles	—	—	—	—	—	—	—	—	20	27	20	27
Karungannies	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	26	25	26	25	45	52	71	77
SALES	—	—	—	—	(f) 9	(f) 10	9	10	1	1	10	11
COXILLAS	—	—	—	—	(d) 5	(d) 8	8	14	4	—	12	14
Unclassified	3	6	—	—	—	—	—	—	—	—	—	—
Total Indian Cotton	375	436	99	219	329	382	803	1037	1003	934	1806	1971

* Standard Indian bales of approximate average gross weight 400 lbs and net weight 382 lbs of cleaned

(a) In Baroda State
(b) At Gadag.
(c) In Madras Province.

(d) In Hyderabad State.
(e) In Indore State
(f) In Indore and Gwalior States

(m) At Hubli and Gadag
(n) In Mysore State
(o) At Gadag and Bailhongal
(p) In Hyderabad State and
Province.
(r) In Hyderabad State
since and at Bija

STOCKS OF RAW COTTON HELD BY THE

(Compiled from voluntary returns)

(In thousand bales)

Trade Descriptions of Cotton.				Bombay Island.	Ahmedabad.	Rest of Bombay Province.	Total Bombay Province.	Madras North.	Madras South.	Total Madras Province.	United Provinces.	Central Provinces.	Berar.	Total O.P. and Berar.	Bengal.	Punjab and
DECCANS—																
U. P. Deshi .. .. .	..	..	..	32	..	..	32	..	..	..	31	..	..	..	1	5
Punjab Deshi .. .. .	..	..	..	1	..	..	1	..	..	..	4	..	..	..	..	17
Sind Deshi .. .. .	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..
Rajputana Deshi .. .. .	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..
Total .. .. .	..	..	..	7	..	2	9	..	..	..	35	..	..	..	1	22
AMERICANS—																
Sind Sudhar (280-F-1) .. .. .	..	..	..	11	4	..	15	..	3	3	..	..	..	..	..	..
Sind-(Unspecified & 4F-0s) .. .. .	..	..	..	9	..	1	10	..	8	9	..	..	..	..	..	..
Punjab-280-F .. .. .	..	..	..	24	2	..	26	2	7	9	14	..	..	..	3	2
Punjab-L.S.S. .. .. .	..	..	..	4	1	..	5	..	2	2	8	..	..	..	2	2
Punjab-(Unspecified-4F) .. .. .	..	..	..	17	1	..	18	..	9	9	57	..	..	..	6	14
Buri .. .. .	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
Dharwar-(Gadag 1) .. .. .	..	..	..	1	..	1	2	..	..	..	..	..	..	..	..	..
Dharwar-(Upland-Unspecified) .. .. .	..	..	..	1	..	1	2	..	1	1	..	..	..	..	..	..
Cambodia Co. .. .. .	..	..	..	..	..	..	..	38	..	38	..	..	..	..	..	..
Cambodia (Unspecified) .. .. .	..	..	..	2	..	..	2	14	..	14	..	..	..	..	1	..
Total .. .. .	..	..	..	69	8	3	80	2	83	85	79	..	..	..	12	18
OOMRAS—																
C. P. and Nimar Oomras .. .. .	..	..	..	5	..	1	5	1	1	..	30	2	32	..	..	..
Berar Oomras .. .. .	..	..	..	5	..	..	6	..	..	..	9	3	12	..	..	..
C. P. and Berar Verum .. .. .	..	..	..	7	1	2	10	..	..	..	9	3	12	2	..	..
Khandesh Oomras .. .. .	..	..	..	5	1	1	7	2	2	..	..	1	1	..	..	..
Khandesh Banilla .. .. .	..	..	..	..	1	6	7	1	1	..	..	..	..	..	..	..
Barsi-Nagar Oomras .. .. .	..	..	..	2	..	10	12	..	..	..	..	..	..	..	..	..
Hyderabad Oomras .. .. .	..	..	..	2	..	4	6	3	..	3	2	..	2	..	..	..
Total .. .. .	..	..	..	26	3	24	53	3	4	7	50	9	59	2	..	..
HYDERABAD GAORANI				6	..	13	19	..	..	..	10	..	10	..	..	..
CENTRAL INDIA—																
Malvi .. .. .	..	..	..	3	..	..	3	1	1	2	..	..	..	..	..	..
Central India—Others .. .. .	..	..	..	2	1	..	3	7	8	2	..	..	..	..	..	..
Total .. .. .	..	..	..	5	1	..	6	2	9	4	..	..	..	..	..	..
BROACH				26	22	2	50	3	3	..	..	..	..	..	1	..
SURTI				16	21	2	39	..	..	..	1	..	1	..	..	..
DHOLLERAS—																
Gujarat-Dhollerias .. .. .	..	..	..	6	6	1	13	..	..	..	..	..	..	..	..	..
Gujarat-Short Staple .. .. .	..	..	..	1	3	1	5	..	..	..	..	..	..	..	..	..
Kathiawar-Dhollerias .. .. .	..	..	..	2	2	..	4	1	1	..	..	..	..	..	..	..
Kathiawar-Short Staple .. .. .	..	..	..	1	1	..	2	..	..	..	..	..	..	..	..	..
Cutch-Dhollerias .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total .. .. .	..	..	..	10	12	2	24	1	1	..	..	..	..	..	..	..
SOUTHERNS—																
Kumtas Jayawant .. .. .	..	..	..	7	..	3	10	15	3	18	..	..	..	..	..	..
Kumtas (Unspecified) .. .. .	..	..	..	10	..	6	16	1	..	1	..	..	..	..	..	..
Bljapur and Bagalkot Jowari .. .. .	..	..	..	1	..	8	9	..	..	..	..	..	..	..	1	..
Westerns .. .. .	..	..	..	4	1	5	10	14	5	19	..	..	..	..	..	..
White and Red Northern .. .. .	..	..	..	..	1	..	1	5	1	6	..	..	..	..	1	..
Warangal and Cocanadas .. .. .	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..
Chinnapathi (Short staple) .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total .. .. .	..	..	..	22	2	24	48	35	9	44	1	..	..	..	2	..
TINNEVELLIES (including Karungannies)																
Tinnevellies .. .. .	..	..	..	..	..	..	..	25	25	..	..	..	..	..	..	..
Karungannies .. .. .	..	..	..	..	..	..	..	25	25	..	..	..	..	..	..	..
Total .. .. .	..	..	..	..	..	..	..	50	50	..	..	..	..	..	..	..
SALEMS				..	..	..	..	1	1	..	..	..	..	..	..	..
COMILLAS				..	..	..	..	..	..	..	..	..	..	..	..	..
Total Indian Cotton .. .. .	..	..	..	187	69	72	328	47	153	200	119	61	9	70	18	40
AMERICANS				41	4	3	48	1	1	..	..	..	..	1	2	1
EGYPTIANS				9	17	1	27	1	3	4	..	..	..	1	2	..
EAST AFRICANS				15	24	4	43	1	1	1	..	..	..	1	..	..
OTHERS (Sudan, Burma, etc.)				15	3	1	19	1	1	..	..	..	..	1	..	..
Total Foreign Cotton .. .. .	..	..	..	80	48	9	137	1	6	7	3	..	3	4	1	..
GRAND TOTAL .. .. .	..	..	..	267	117	81	465	48	159	207	119	64	9	73	22	41

MILLS IN INDIA ON 31st AUGUST, 1940.

furnished by mills)

of 400 lbs each)

Port of British India	Total British India	Hyder abad	Mysore	Baroda	Gwalior	Indore	Kathiawar States	Other Indian States	London cherry	Total Indian States	GRAND TOTAL	Trade Descriptions of Cotton
1	40		1		1					1	41	BEWAILS—
6	26							2		1	27	U P Deshi
	7									1	8	Punjab Deshi
	1									1	9	Sind Deshi
												Rajputana Deshi
7	74		1		1			2		4	78	Total
	18								1	19		AMERICANS—
	18							1	5	6		Sind Sudhar (239 F 1)
	54		1					1		12		Sind (Unspecified & 4F 98)
2	21				1					1	56	Punjab 239 F
1	105				6	1		1		8	113	Punjab L S S
	1										1	Punjab (Unspecified 4F)
	2										3	Buri
	3		1							1	3	Dharwar (Gadag 1)
	34		1					1		2	40	Dharwar (Upland Unspecified)
	17					1				1	18	Cambodia Coz
												Cambodia (Unspecified)
3	27		3		7	2		4	6	20	290	Total
	33					1		1	1	3	41	OOMRAS —
	18					1				4	20	C P and Nimar Oomras
	24				1	1				3	27	Berar Oomras
	10					1				1	11	C P and Berar Verum
	8										8	Khandesh Oomras
	12										12	Khandesh Banilla
	11	9	1					1		11	22	Barsi Nagar Oomras
												Hyderabad Oomras
	121	9	1		3	5		3	1	22	143	Total
	29	13	1							14	43	HYDERABAD GAORANI
	6			1	3	4		3		11	17	CENTRAL INDIA—
	13				1	2				3	16	Malvi
												Central India—Others
	19			1	4	6		3		14	33	Total
	54	1		5		1	2			9	63	BROACH
	40			6			3			9	49	SURETI
	13						2			3	16	DHOLLERAS—
	5									1	6	Gujarat-Dholleras
	4									4	9	Gujarat Short Staple
	2						2				2	Kathiawar Dholleras
												Kathiawar Short Staple
												Cutch Dholleras
	25			4			4			8	33	Total
	28		5					8		5	33	SOUTHERNS—
	18		15							23	41	Kumtias Jayawant
	9										9	Kumtias (Unspecified)
	30		9							9	39	Bijapur and Bagalkot Jowari
	7		5							5	12	Westerns
	3	3								3	6	White and Red Northern
												Warangal and Cocanadas
												Chinnappathi (Short staple)
	95	3	34					8		45	140	Total
	25										25	TINNEVELLIES (including Karungannies)
	5		1						1	2	27	Tinnevelles
												Karungannies
	50		1						1	2	52	Total
	1										1	SALEMS
												COMILLAS
10	785	96	41	16	15	14	9	20	8	149	934	Total Indian Cotton
	51			1						1	52	AMERICANS
	33		1	1						12	35	EGYPTIANS
	47		1	5			1			7	54	EAST AFRICANS
	21			1						1	20	OTHERS (Sudan Burma etc)
	150		2	8			1			11	163	Total Foreign Cotton
10	937	26	43	24	15	14	10	20	8	160	1 097	GRAND TOTAL

STOCKS OF INDIAN COTTON ON 31ST JANUARY, 1940, HELD BY THE MILLS AND THE TRADE
IN MADRAS PROVINCE.

(In Thousand bales of 400 lbs. each.)

Trade Descriptions of Cotton.	MILL STOCKS ON 31ST JANUARY.					TRADE STOCKS ON 31ST JANUARY.					TOTAL STOCKS ON 31ST JANUARY.				
	1936.	1937.	1938.	1939.	1940.	1936.	1937.	1938.	1939.	1940.	1936.	1937.	1938.	1939.	1940.
Tinnevellies ..	14	28	22	32	20	12	4	18	4	2	26	32	40	36	22
Salems..	6	8	15	16	4	3	2	3	8	3	9	10	18	24	7
Cambodias ..	41	47	46	71	33	22	11	14	17	5	63	58	60	88	38
Northerns & Westerns.	14	22	24	19	15	(a)	11	12	18	2	14	33	36	37	17
Cocanadas ..	†	†	†	1	1	(a)	10	12	14	8	..	10	12	15	9
Outside Cottons ..	28	34	50	27	49	(a)	..	..	..	..	28	34	50	27	49
Total ..	103	139	157	166	122	37	38	59	61	20	140	177	216	227	142

(a) Figures not collected.

(a) Figures not collected.

† Less than 500 bales.

APPENDIX VI.

EXPORTS BY SEA OF INDIAN RAW COTTON CLASSIFIED BY VARIETIES
 (Compiled from voluntary returns furnished by exporters)
 1st September 1930 to 31st August 1940
 (In thousand bales* of 400 lbs each)

Trade Descriptions of Cotton	Exported to				Total Exports
	Europe (excluding United Kingdom and the West)	United Kingdom	Japan	China and the East (excluding Japan)	
0113—					27
P Doshi	7	5	15	—	466
Punjab Doshi	166	93	168	39	136
Ind Doshi	68	49	13	6	10
Rajputana Doshi	2	2	6	—	639
Total	243	140	202	45	
0114—					77
Sind Sudhar (250 F 1)	33	6	—	33	42
Sind—(Unspecified & 4 F 93)	7	—	5	8	24
Punjab—250 F	3	—	1	20	16
Punjab—L S S	7	—	87	8	331
Punjab—(Unspecified—4 F)	33	113	7	98	2
Buri	—	—	—	3	10
Dharwar—(Gadag 1)	—	—	—	1	1
Dharwar—(Upland Unspecified)	—	—	—	—	4
Cambodia Co 2	—	—	—	4	
Cambodia (Unspecified)	—	—	—	—	506
Total	85	141	100	180	
00K1—					78
C P and Nmar Oomras	11	44	10	13	255
Berar Oomras	20	0	179	47	10
C P and Berar Verum	7	4	4	2	180
Khandesh Oomras	—	5	127	41	6
Khandesh Banilla	3	—	4	2	90
Bari Nagar Oomras	2	7	65	15	16
Hyderabad Oomras	—	2	12	—	635
Total	43	71	401	120	
HYDERABAD GAOHANI					5
	—	—	—	—	72
	—	1	4	24	77
	7	1	40	24	80
	7	2	44	50	54
CENTRAL INDIA—					
Malvi	7	11	11	14	17
Central India—Others	8	2	—	—	2
Total	38	2	—	—	25
BROACH					38
	—	—	8	9	2
	—	—	2	6	84
SCATI					
	—	1	15	—	
	4	7	11	—	
	11	—	2	—	
DHOLLERAS—					
Gujarat Dholeras	—	—	8	23	
Gujarat Short staple	—	—	—	—	
Kathlawar Dholeras	—	—	—	—	
Kathlawar Short staple	—	—	—	—	
Cutch Dholeras	—	—	—	—	
Total	15	8	38	5	10
	—	—	—	10	7
	—	—	—	5	39
	—	—	—	23	6
	—	—	—	3	—
	—	—	—	—	—
SOUTHERNS—					
Kumtias Jayawant	5	19	—	—	89
Kumtias (Unspecified)	3	—	—	—	
Bhapur and Bagalkot	3	—	—	—	
Westerns	—	—	—	—	
White and Red Northern	—	—	—	—	
Warangal and Cocanadas	—	—	—	—	
Chinnapathi (Short staple)	—	—	—	—	
Total	11	19	8	8	
	—	—	—	6	
	—	—	—	—	
	—	1	—	14	
	—	—	—	—	
	—	1	—	1	
	6	2	—	—	
	14	6	—	—	
	—	—	—	—	
	—	—	—	22	
	470	412	806	550	
SALEMS					
COMILLAS					
UNCLASSIFIED					
Total Indian Cotton					

* In bales of approximate average gross weight 400 lbs and net weight 392 lbs of

APPENDIX

RECEIPTS AT MILLS IN INDIA OF

(Compiled from voluntary
1st September 1939 to
(In thousand bales)

Trade Descriptions of Cotton.	Bombay Island.	Ahmedabad.	Rest of Bombay Province.	Total Bombay Province.	Madras Province.	United Provinces.	C. P. & Berar.	Bengal.	Punjab and Delhi.	Rest of British India.
BENGALS—										
U. P. Deshi	0	—	1	7	—	—	—	—	—	—
Punjab Deshi	14	—	3	17	1	87	—	6	35	4
Sind Deshi	2	—	—	2	—	9	—	8	59	—
Rajputana Deshi	0	1	—	7	—	—	—	—	—	7
Total	28	1	4	33	1	106	—	14	94	11
AMERICANS—										
Sind Sudhar-(280-F-1)	41	23	1	65	6	—	—	1	—	—
Sind-(Unspecified & 4-F-08)	41	10	2	53	36	—	—	3	—	—
Punjab-280-F	82	13	2	97	22	20	—	16	4	1
Punjab-L. S. S.	6	2	—	8	5	18	—	12	2	4
Punjab-(Unspecified-4F)	49	4	1	54	22	129	—	32	72	6
Burl	1	—	—	1	—	—	—	—	—	—
Dharwar-(Gadag 1)	9	1	3	13	—	—	—	—	—	—
Dharwar-(Upland-Unspecified)	2	—	4	6	1	—	—	—	—	—
Cambodia Co. 2	—	—	—	—	126	—	—	—	—	—
Cambodia (Unspecified)	4	1	—	5	48	—	1	3	—	—
Total	235	54	13	302	266	167	1	67	78	11
OOMRAS—										
C. P. and Nimar Oomras	15	—	1	16	3	1	71	5	—	—
Berar Oomras	14	1	3	18	—	—	37	2	—	—
C. P. and Berar Verum	22	3	3	28	4	—	21	6	—	—
Khandesh Oomras	18	2	3	23	4	—	—	—	—	—
Khandesh Banilla	1	3	16	20	2	—	—	—	—	—
Baral-Nagar Oomras	8	—	37	45	—	—	—	—	—	—
Hyderabad Oomras	11	—	11	22	3	—	3	—	—	—
Total	80	9	74	172	16	1	132	13	—	—
HYDERABAD GAORANI	27	—	31	58	—	—	19	—	—	—
CENTRAL INDIA—										
Malvi	1	4	1	6	1	10	—	—	—	—
Central India—Others	11	6	1	18	21	7	—	—	—	—
Total	12	10	2	24	22	17	—	—	—	—
BROACH	100	74	3	177	7	—	—	1	—	—
SURTI	45	74	5	124	1	—	1	—	—	—
DHOLLERAS—										
Gujarat-Dholleras	15	37	4	56	—	—	—	—	—	—
Gujarat-Short staple	6	21	1	28	—	—	—	—	—	—
Kathiawar-Dholleras	8	11	1	20	1	—	—	—	—	—
Kathiawar-Short staple	4	4	—	8	—	—	—	—	—	—
Cutch-Dholleras	—	—	—	—	—	—	—	—	—	—
Total	33	73	6	112	1	—	—	—	—	—
SOUTHERNS—										
Kumtas Jayawant	20	2	12	34	23	—	—	—	—	—
Kumtas (Unspecified)	20	2	20	42	2	1	—	—	—	—
Bijapur and Bagalkot Jowari	2	—	37	39	—	—	—	—	—	—
Westerns	24	5	6	35	27	1	—	2	—	—
White and Red Northern	—	1	2	3	5	—	—	1	—	—
Warangal and Cocanadas	1	1	—	2	4	—	—	6	—	—
Chinnappathi (Short staple)	—	—	—	—	—	—	—	—	—	—
Total	67	11	77	155	61	2	—	9	—	—
TINNEVELLIES (including Karungannies)										
Tinnevelles	1	—	—	1	55	—	—	—	—	—
Karungannies	—	—	—	67	—	—	—	—	—	—
Total	1	—	—	1	122	—	—	—	—	—
SALEMS	—	—	—	—	5	—	1	—	—	—
COMILLAS	—	—	—	—	—	—	—	—	—	—
Total Indian Cotton	637	306	215	1,158	502	293	153	105	172	22
AMERICANS	63	7	5	75	4	—	—	6	—	—
EGYPTIANS	24	55	2	81	14	—	1	1	2	—
EAST AFRICANS	56	129	10	195	1	—	2	15	—	—
OTHERS (Sudan, Burma, etc.)	34	22	1	57	1	—	2	2	—	—
Total Foreign Cotton	177	213	18	408	20	—	5	24	2	—
GRAND TOTAL	814	519	233	1,566	522	293	158	129	174	22
Indian raw cotton consumed in mills in India. (Figures compiled mainly from returns under the Indian Cotton Cess Act—Bales of 400 lbs. net.)	634	305	233	1,172	507	350	143	101	144	45

* Standard Indian bales of approximate average gross

VII. RAW COTTON CLASSIFIED BY VARIETIES.

returns furnished by mills.)
31st August 1940.
of 400 lbs. each.)

Total British India.	Hyder- abad.	Mysore.	Baroda.	Gwalior.	Indore.	Kathiawar States.	Other Indian States.	Pondicherry.	Total Indian States	GRAND TOTAL.	Trade Descriptions of Cotton
150	—	—	—	16	—	—	1	—	17	167	BENGALS—
97	—	—	—	—	—	—	—	—	4	97	U P Deshi
2	—	—	—	—	—	—	—	—	2	2	Punjab Deshi
31	—	1	—	2	—	—	9	—	14	23	Sind Deshi
											Rajputana Deshi
259	—	3	—	18	—	—	12	—	35	294	Total
72	—	—	—	—	—	—	1	1	2	74	AMERICANS—
92	—	—	—	—	—	—	3	12	15	107	Sind Sudhar (289 F-1)
169	—	—	—	—	—	—	4	—	6	166	Sind (Unspecified & 4 F 93)
49	—	—	—	—	—	—	1	—	4	53	Punjab 289 F
315	—	1	1	27	—	—	4	3	37	352	Punjab-L. 8 8
1	—	—	—	—	—	—	—	—	—	1	Punjab-(Unspecified 4F)
13	—	1	—	—	—	—	—	—	1	14	Buri
7	—	1	—	—	—	—	—	—	—	9	Dharwar-(Gadag 1)
126	—	1	—	—	—	—	5	—	6	132	Dharwar (Upland Unspecified)
57	—	—	—	—	—	—	1	—	3	60	Cambodia Co 2
											Cambodia (Unspecified)
892	—	4	3	30	4	—	19	10	76	968	Total
96	—	1	—	—	11	—	4	1	17	113	OOMRAS—
57	—	—	—	—	10	—	1	1	15	72	C P and Nimar Oomras
59	—	—	—	—	—	—	—	—	9	63	Barar Oomras
27	—	—	—	—	1	—	—	—	3	30	C P and Barar Verum
25	—	—	—	—	—	—	—	—	—	22	Khandesh Oomras
45	—	—	—	—	—	—	—	—	—	45	Khandesh Banilla
23	15	1	—	—	—	—	2	—	18	46	Barar Nagar Oomras
											Hyderabad Oomras
334	15	2	3	7	24	—	9	2	62	396	Total
77	23	4	—	—	—	—	—	—	32	109	HYDERABAD GAORANI
17	—	—	5	25	54	—	15	—	99	116	CENTRAL INDIA—
46	—	—	3	2	33	—	1	—	39	85	Malvi
											Central India—Others
63	—	—	8	27	87	—	16	—	133	201	Total
185	2	—	12	—	1	6	—	—	21	206	BEOACH
126	—	—	20	—	—	10	—	1	31	157	SURTI
56	—	—	6	—	—	5	—	—	11	67	DHOLLERAS—
23	—	—	1	—	—	—	—	—	4	32	Gujarat Dholeras
21	—	—	9	—	1	14	1	—	24	45	Gujarat-Short staple
8	—	—	1	—	—	2	—	—	3	11	Kathiawar-Dholeras
											Kathiawar Short staple
											Cutch Dholeras
113	—	—	17	—	1	21	3	—	42	155	Total
57	—	6	—	—	1	—	—	—	7	64	SOUTHERNS—
45	—	22	1	—	—	1	12	—	36	81	Kumtias Jayawant
39	—	1	—	—	—	—	—	—	1	40	Kumtias (Unspecified)
65	—	17	2	—	—	1	—	1	21	86	Bilapur and Bagalkot Jowari
9	—	6	—	—	—	—	—	—	7	18	Westerns
12	7	—	—	—	—	—	—	—	7	19	White and Red Northern
											Warangal and Cocanadas
											Chinnapathi (Short staple)
227	7	52	3	—	1	2	12	2	79	306	Total
56	—	—	—	—	—	—	—	—	—	56	TINNEVELLIES (including
67	—	1	—	—	—	—	8	—	4	71	Karungannules)
											Tinnevelles
123	—	1	—	—	—	—	3	—	4	127	Karungannules
5	—	—	—	—	—	—	1	—	1	6	Total
1	—	—	—	—	—	—	—	—	—	1	SALEMS
											COMILLAS
2,405	52	66	66	82	120	39	75	21	521	2,926	Total Indian Cotton
85	—	—	3	—	—	—	—	—	2	87	AMERICANS
99	—	1	8	—	1	—	—	—	10	109	EGYPTIANS
213	—	3	22	—	—	4	3	—	32	245	EAST AFRICANS
62	—	3	4	—	—	—	—	—	4	66	OTHERS (Sudan, Burma, etc.)
459	—	4	36	—	1	4	3	—	48	507	Total Foreign Cotton
2,864	52	70	102	82	121	43	78	21	569	3,433	GRAND TOTAL
2,402	63	63	65	80	120	42	103	†	555	3,017	{ Indian raw mills in India mainly from Indian Cotton (400 lbs net)

weight 400 lbs. and net weight 392 lbs. of cleaned (lint) cotton. † Included under 'Other

in
the
of

APPENDIX VIII.

Rules under "the Baroda Agricultural Produce Markets Act."

PREFACE.

Reasons for framing the rules.

IN order to provide for the establishment of recognised open markets for the purchase and sale of agricultural produce in the interests of agriculturists, "The Agricultural Produce Markets Act" has been enacted and for the present it has been made applicable to Bodeli, Sankheda Taluka, Baroda District and to the Amreli Taluka. As per section 19 of this Act, these rules are framed for the management and regulation of markets. These rules, it is hoped, will be very useful to those who are concerned.

Dated 19th January 1939.

(Sd.) G. T. RANADIVE,
Superintendent.

(Sd.) S. V. MUKERJI,
SARSUBA.

Preamble.

Whereas it is expedient to provide for the regulation and management of the markets of Agricultural Produce, under section 19 of the Agricultural Produce Markets Act, it is directed under Huzur orders as follows:—

CHAPTER I.

Preliminary Rules.

Title.

1. These rules shall be called "The Agricultural Produce Market Rules."

Application.

2. According to section 2 of the Act, it is to be understood that these rules also apply to places to which the Act has been applied.

Definition.

3. In these rules, unless there is anything repugnant in the subject or context, the meaning of undermentioned words, should be taken as given below.

Broker.

I. (a) "Broker" means a person who having received a licence under rule 34, conducts the sale of the Agricultural Produce by charging separate *dalali* (Brokerage), and

(b) who does not lend money for purchases.

Act.

II. 'Act' means the "Agricultural Produce Markets Act."

Bye-laws.

III. "Byelaws" mean byelaws framed under section 20 of the Act.

Market Place.

IV. "Market Place" means the place fixed for the purchase and sale of agricultural produce by notifying it under section 5 in the State Gazette.

Vahivatdar.

V. The word "Vahivatdars" also includes "Mahalkaries."

A Dealer.

VI. (a) "A Dealer" is one who himself not being a broker, purchases or sells the agricultural produce, except that of his own land, himself or on behalf of others, or

(b) those commission agents or brokers, who purchase or sell the agricultural produce, on behalf of their clients by charging commission or brokerage

CHAPTER II

Constitution of the Committee, etc

4 (1) Under sub section 2(b) of the Act the Sarsuba shall decide the number of the members that should be in the Committee on the recommendations of —

(a) the municipality of that place,

(b) in absence of municipality, the District Local Board of that place, and

(c) Suba,

by notification in the State Gazette

Constitution of the Committee

(2) According to the above sub rule (1) the following members shall constitute the market committee,

(a) half the number of the members elected by the growers of the agricultural produce of the area to which this Act be applied,

(b) one member elected by the Co operative Societies of such area,

(c) one member elected by the District Local Board of such area,

(d) two members nominated by the Sarsuba with the sanction of the Government,

(e) one member elected by the municipality if in existence in such area and if the municipality is not organised in such area and the Village Panchayat is established, one member elected by Village Panchayat and

(f) the remaining members elected by the dealers of the agricultural produce of such area

Members of the Market Committee

Note —If the number, prescribed in sub rule (1) is odd then to fix half the number according to sub rule (2) (a) one member should be added to the fixed number and then half of the resulting total should be calculated

(3) The Market Committee should elect one of its members as the President

(4) Half of the total number of members shall form a quorum to carry out the work of the Committee

(5)(a) The term of the membership of the elected members of the market committee will be for three years

Period of the Market Committee

(b) During the course of this term, if a vacancy of any member occurs due either to his

(i) permanently leaving the village,

(ii) his tendering resignation

(iii) his death, or

(iv) being declared unfit for reasons shown in rules 6 or 7, or being dismissed,

Consequence
Occasion.

it will be filled up for the remaining term by a member elected by those who elected original member.

(6) The under-mentioned growers of the agricultural produce, living generally, in the talukas, in which the market place is situated, will be considered as voters to elect the member on the market committee and will be eligible for being a member of the Committee :

Voters among
the growers of
the Agricultural
Produce.

(a) those possessing the Government or Barkhali land, of the assessment value of not less than Rs. 25 or which is subject to this assessment,

(b) the cultivator of Government land of assessment value of not less than Rs. 25,

(c) the cultivator of the land of the village, under direct management, of the assessment value of not less than Rs. 25 or subject to this assessment.

Exceptions.—But the below-mentioned persons shall not be considered fit :

(a) one who is declared a bankrupt,

(b) one who is punished within the State or outside by criminal magistrate for an offence under which the liable punishment is of rigorous imprisonment for more than six months,

(c) one who is a

(i) clerk or

(ii) servant of market committee,

(d) one who has a direct or indirect self interest in the committee or in the monopoly or appointments by the market committee,

(e) one who is mad,

(f) one who is less than 21 years in age.

7. The following dealers of the agricultural produce will be eligible to vote in electing a member in the market committee and to be a member on the market committee :

Voters among
the dealers of
agricultural
produce.

(A) He who has purchased or sold in the market agricultural produce not less than 100 khandis (one khandi=20 Baroda maunds) as ascertained from the records of the market, prescribed in the byelaws and who is the leader in his own or joint Hindu family, in the year just previous to that when election is to take place,

(B) (a) The Chief Commission Agent, or

(b) if the Chief Commission Agent is unfit, his junior *commission agent* or servant,

of the firm or the *society* or the co operative society which has purchased or sold agricultural produce not less than 100 khandis as proved from the records of market, given in byelaws, in the year previous to that when election is to take place

(C) Any broker who has purchased or sold the agricultural produce not less than 1500 khandis as proved from the records of the market, given in byelaws, in the year previous to that when election is to take place

Exception —But any person specified in the above rule,

(a) who does not stay generally within ten miles from the limit of the market,

(b) who is a female,

(c) who is less than 21 years in age,

(d) who is mad,

(e) who is declared a bankrupt,

(f) who is punished within the State or outside by criminal magistrate for the offence under which the punishment liable is of rigorous imprisonment for more than six months,

(g) who is

(i) clerk or

(ii) servant of the market committee or

(h) who has direct or indirect self interest in the committee or in the monopoly or the appointments by the market committee,

(i) who, being a dealer in agricultural produce, has not registered his name under section 33 of the rules, will not be considered fit

8 (A) Under section 5 of the Act, when the market is first notified, the Suba shall get the list of fit persons, prepared in accordance with Sections 6 and 7 of the rules,

(B) These persons shall be the voters from the growers as well as the sellers of the agricultural produce for the first election List of voters

(C) At the time of the second election, after the first election, the market committee should get prepared one list of the authorised voters, from the records of the market, prescribed in byelaws and send it to Suba,

(D) The Suba should dispose of the applications showing objections against the enlisted names, or for enlisting any name or names, in this list,

(E) In this matter, the decision of the suba will be final

9. (1)(A) The Suba

Publication of
names of
voters and
members.

(a) should publish two lists of voters in Gujarati at the well known part of the market place before first May,

(b) should fix a date for election upto 15th June and should publish as a notification at the well-known part of that market place.

(B) The Suba, or the officer authorised by him on paper, should make necessary arrangements

(i) to supervise the work of election,

(ii) to see whether the election is carried on systematically and

(iii) to publish the result of election

(C) The Suba should publish the names of elected members for the market committee in the State Gazette upto 15th July.

(2) In the list of voters, there should be,

Details in list of
voters.

(a) the name of person,

(b) his father's name,

(c) place of residence,

(d) serial number of voter and

(e) details regarding qualification for voting as per rule 6.

Copies of list.

(3) The Suba should get prepared the required number of copies of such list and fix their prices.

Sale of copies
of list.

(4) The Suba should give the copies of the list of voters to the candidates at fixed price.

The office to
collect votes
for electing
members of
co-operative
societies.

10. (1) The inspector of the co-operative societies of that division will act as an officer for collecting votes of his division for electing a member on behalf of the taluka co-operative societies.

Registering
name of
member for
election.

(2) That member of the co-operative societies, who wants to be a candidate for being a member of the market committee, should report his name to the inspector of the societies, before the date fixed by the Suba.

Sending names
to Co-operative
societies.

(3) The inspector should send the names, thus reported, to the co-operative societies.

Sending copy
of resolution
to inspector.

(4) Each co-operative society should fix as to who should be elected from the names, received from the inspector, in its meeting and pass a resolution and should send a copy of that resolution to the inspector.

Announcing
result of
election.

(5) The inspector after compiling the resolutions, thus received from the co-operative societies, should send a report to the Suba through the Vahivatdar for announcing the elected person getting the highest number of votes.

(6) The Suba, thus after getting the names of the member, of the co-operative societies, from Valhavatdar, should publish the name of the elected person in the State Gazette. Suba to publish name

11 (A) The market committee shall completely supervise the market of the agricultural produce Supervise of market committee

(B) The market committee shall also manage and supervise the bazar roads, wells, water troughs, and buildings, etc., of that market

12 (A) The President of the market committee, shall give a casting vote, over and above his vote as a member, at the occasion when there are equal votes in a meeting The vote of President

(B) He should keep the proceedings of the meeting, signed by him

13 The market committee should employ officers and servants as found necessary Finance of market committee

(A) (i) for the management of the market and

(ii) for the supervision whether they behave according to the Act and Rules, as well as

(B) should fix their pay, etc

14 The year of the market committee shall be considered from the 1st August to 31st July. Commencement of the year

15 The market committee

(A) should maintain the account of the receipts and the expenditure, The accounts of the committee

(B) should get this account audited by the account auditor appointed by it, and

(C) should publish the account each year

16 (A) The responsibility of keeping the records and the accounts of the market committee, regular, shall rest with the chief officer appointed by the market committee for this work Responsibility of accounts.

(B) That officer

(i) should correspond in name of the committee, and

(ii) publish the account and report

(C) The responsibility of the accounts kept with this officer shall rest with him

17 The market committee should not keep the saving of the fund in which is large as shown in sub section (2)(b) of the section 12 of the Act, but invest on interest Invest the saving of the fund on interest

(A) in the promissory notes of Government of India, debentures and stocks,

(H) in stocks, debentures, or shares of railway or other companies, certified by the Secretary of State for India,

(C) in mortgaging the immovable property with no other debt, in Baroda State,

Note.—(i) The cost of property should not be less than $\frac{4}{3}$ rd of the invested capital,

(ii) the cost of the building, if any, should not be less than $\frac{3}{2}$ of the invested capital.

(D) in Bank of Baroda,

(E) in any organisation of the Government for investing such amounts or which will be organised hereafter and which pay interest, or

(F) in any other way as directed by the Government occasionally.

Sanction of budget.

18. The market committee should sanction its budget every year three months before the commencement of the new year.

Powers of the market committee and control.

19. (A) The market committee, in accordance with these rules as well as the byelaws, shall use all powers, but

(B) these powers shall be controlled by the Suba.

The Suba shall appoint for helping the market committee.

20. (A) The Suba of the District shall entrust the work

- (1) of supervision on dealings of the market committee, as well as
- (2) of giving the necessary help, to the officer of the rank, not lower than the Vahivatdar.

(B) This officer

- (1) shall supervise the dealings of the market committee,
- (2) shall help the market committee when necessary and work without allowance and
- (3) shall report any matter to the Suba, when needed.

The market committee should send copy of resolution to Suba.

21. The market committee should send the copy of the resolution passed by it to the Suba of the District within ten days from the date of resolution.

22. The market committee shall possess the powers

(1)(a) to fix the limit of the place for purchases and sales of the agricultural produce, and

(b) to make necessary changes occasionally,

(2) to fix time for keeping the market open and

(3) to fix the place for carting, etc. in the market,

in the limit of the market as fixed by Sarsuba under section 5 of the Act.

To fix the area, limit and time, place for carts, etc.

23 The weighing or the measure of the agricultural produce shall be carried out at a place, fixed by committee, under the supervision

(a) of the committee, or

(b) of persons employed by the committee.

24 (1) The Agricultural produce will not be measured or weighed by the scales, weights and measures unless approved by the committee.

(2) As given in sub rule (1), the inspection of scales, weights and measures should be made every year by those appointed by the committee at the prescribed time.

25 The register showing the trade allowance sanctioned by the market committee should be published on the notice board for the information of the sellers in the market.

Explanation - For the reason of this rule it should be considered that the word trade allowance also includes "brokerage."

26. (1) No more commission or deduction shall be charged than those fixed on the produce for sale and published on the notice board in the market by the market committee

(2) Any

(a) seller of produce,

(b) purchaser of produce,

(c) registered merchant,

(d) his servant, or

(e) broker

shall not take

(i) the amount for charity, or

(ii) allowances

27. The price of the agricultural produce, when fixed

(1)(a) The market committee or (b) the market committee shall settle the disputes

(A) between a buyer and a seller, or

(B) between their agents, regarding

(i) the quality of produce.

(ii) weight,

(iii) deductions for

Supervise weight of produce.

The approval of the committee for balance, weights and measures. Inspection of balance, weights and measures.

Publication of trade allowance in market.

No extra commission or deduction shall be charged.

No extra commission or deduction shall be charged.

The market committee shall settle the disputes between a buyer and a seller, or between their agents, regarding the quality of produce, weight, deductions for

(iv) deductions, allowances, dirt particles, etc.; etc., significant as well as insignificant matters, in the articles of agricultural produce.

Final decision.

(2) The settlement of disputes according to sub-rule (1) shall be considered final.

29. (1) The market committee should keep the lists

(A) (i) of registered merchants,

(ii) of licentiated brokers,

(iii) of the weighment and

(B) should publish its copy on the notice board of the market, and

(C) should publish the information regarding the

(i) removal of name of any merchant from the register, or

(ii) the licence of any person, if cancelled,

(a) for some time, or

(b) permanently.

on the notice board.

Not to exact work without licence.

(2) if any person will exact work, for which the market committee has issued licence, from any one possessing no licence,

Occasion.

(A) he will be subject to dismissal from the market after giving notice to that person and

Consequence.

(B) if that person possesses any licence, it will be subject to cancelling.

The market committee shall weigh with fixed rate.

30. (A) When the amount is available, the market committee shall provide big scales and balances to weigh the articles of the agricultural produce.

(B) The purchasers or sellers can get their produce, if they desire, weighed at these scales and balances, on payment of charges fixed by the committee,

Tax per cart carrying produce for sale.

31. (A) The tax fixed by the market committee per each cart, bringing the articles of agricultural produce in the market shall be recovered from those bringing the produce.

(B) Unless and until it is recovered, they will not be allowed to bring the produce.

The market committee to provide godown and frame bye-laws for rent.

32. The market committee at its convenience, should keep godown to store the agricultural produce and frame bye-laws for rent.

CHAPTER III.

Licences.

Not to sell agricultural produce unless registered as a merchant.

33. (1)(A) Any person, who has not registered his name as a merchant, shall not sell the articles of the agricultural produce on the prescribed area of that market, but

(B) it should not be considered that producer of agricultural produce is prohibited to sell the products of his own land independently

(2) If any person, who does not carry out the transactions as broker after giving written agreement, applies in writing to the office of the market committee Registration of Merchants

(A) to behave according to the Act and Rules and

(B) to pay the licence fees as prescribed in bye laws

his name will be registered as a merchant and he will be given the licence

(3)(A) The period of the licence fees to be taken, as above, from the merchants will be from 1st August to 31st July The duration of licence

(B) Every year, the licence will be renewed on payment of licence fees in this way.

34 (1) If any person, after giving written agreement

(A) to behave according to Act and Rules, and

(B) to pay the licence fees as prescribed in bye rules,

Licence for brokers and weighmen

applies in writing to the office of the market committee to get a licence to work

(i) as a broker, or

(ii) as a weighman,

the market committee should issue the licence to work as a broker or as a weighman

(2)(A) The period of receiving the licence fees, as above, will be from 1st August to 31st July Licence fee

(B) Every year the licence will be renewed on payment of licence fees in this way before the period terminates

35 (1) If the licensee disagrees with the written agreement, given to the committee as per sub rule (2) of the rule 33 and rule 3 the committee will cancel the licence issued to him To cancel the licence
Consequence

(A) for some time, or

(B) permanently

Occasion

(2) The person, whose licence is cancelled according to the above subrule, will be entitled to appeal to the Suba of the district within 30 days from the date of the order Appeal on order

36 The person, possessing licence subject to these rules

(A) should keep the records of the account etc according to systems and styles prescribed by the market committee, occasionally and

(B) should submit them when required for audit without delay and disputes

The licence to keep accounts

37 (A) The person possessing licence given by the market committee on payment of licence fees, or No person shall work without licence

- (B) any other person except that employed by the committee,
 (i) shall not weigh the agricultural produce in the market, or
 (ii) shall not get the charge for any work regarding sale and purchase of the stock.

The charges
for weighmen.

38. The licenced weighmen are not entitled to take more charges than those prescribed by the committee for weighing.

The weighmen
to put on belt.

39. The market committee

- (A) should give a belt as prescribed in byelaws to the weighmen and
 (B) he should put on the belt at the time of weighing the produce.

CHAPTER IV.

Duties.

The purchasers
to give receipts
to produce-
sellers.

40. (1) If

(A) a merchant, or

(B) the grower of the agricultural produce sells articles of agricultural produce, the merchant, purchasing the produce,

- (i) should give the written or printed receipt to the seller and
 (ii) in it should describe

(a) the weight of the produce and

(b) the rate of the produce sold.

Receipt
according to
appendix
form I.

(2) The receipt, prescribed in sub-rule (1) should be according to appendix, form I.

Penalty to
those working
without licence.

41. If any person

(A) will work as a broker or a weighman without licence from market-committee or

(B) will weigh the produce without putting on the belt, given by the committee,

Occasion-
consequence.

he will be liable to be punished with a fine of upto Rs. 50 on confirmation of the offence.

Occasion-
consequence
Penalty for
person working
in market
without licence.

42. If any person, whose licence, issued by the market committee, is cancelled, takes part in any work of selling or purchasing the produce in the market, he will be liable to be punished with a fine upto Rs. 50 for every offence.

Penalty for
breach of
conditions of
the committee.

43. If any person

(A) (i) enters or

(ii) tries to enter,

the market at the unusual time, or

Occasion.

(B) violates the condition notified by the market committee regarding the arrangement of the cart, etc. full of produce,

Consequence.

he shall be liable to be punished with a fine, extending to Rs. 10 for every offence, on confirmation of that offence.

Dated 9th January 1939.

(Sd.) N. V. PANDIT,
N. P. ADHIKARI.

(Sd.) S. V. MUKHARJI,
Sarsuba,

FORM I

(See Rule No 40)

Form of Receipt

Name of the seller and his village

Name of purchaser and his village

Name of weighman

Details of produce

Rate

Weight

Date

Signature of Commission agent or the purchaser

APPENDIX IX.

Central Provinces and Berar Act No. XXXIII of 1939.

THE CENTRAL PROVINCES AND BERAR COTTON GINNING AND PRESSING FACTORIES (AMENDMENT) ACT, 1939.

[First published, after having received the assent of the Governor, in the *Central Provinces and Berar Gazette* on the 6th October 1939].

An Act further to amend the Cotton Ginning and Pressing Factories Act, 1925, in its application to the Central Provinces and Berar.

XII of 1925. Whereas it is expedient further to amend the Cotton Ginning and Press- Preamble.
ing Factories Act, 1925, in its application to the Central Provinces and Berar,
for the purpose hereinafter appearing ;

It is hereby enacted as follows :—

1. This Act may be cited as the Central Provinces and Berar Cotton Short title.
Ginning and Pressing Factories (Amendment) Act, 1939.

XII of 1925. 2. After section 2-A of the Cotton Ginning and Pressing Factories Insertion of
Act, 1925, the following section shall be deemed to be inserted, namely :— section 2-B,
Act XII of 1925.

“ 2-B. (1) This section shall come into force from such date as the Control of rates
Provincial Government may, by notification, direct and shall remain in chargeable for
operation for a period of five years from that date. ginning and
 pressing cotton.

(2) The Provincial Government may, by notification, extend this section to any local area, and during the continuance of such notification no owner or person in charge of a cotton ginning or cotton pressing factory situate in such local area shall charge for the ginning or pressing of cotton, rates in excess of such maxima as may be fixed by the rate-fixing committee of such local area under sub-section (8).

(3) There shall be a rate-fixing committee for each local area in which a notification under sub-section (2) is in operation. Such committee shall consist of the Deputy Commissioner of the district, who shall be the chairman of the committee, and the following members, namely :—

- (a) two representatives of cotton growers of the local area ;
- (b) two representatives of owners of cotton ginning and cotton pressing factories in the local area ;
- (c) one non-official possessing special or technical knowledge of cotton ginning and pressing or of cotton trade to be nominated by the Director of Industries of the province ;
- (d) the Chief Inspector of Factories and Boilers of the province.

(1) The two representatives referred to in clause (a) of sub section (3) shall be elected by cotton growers whose names are for the time being included in the voters' lists of the cotton growers' electorates formed for the constitution of market committees for the management of any cotton markets established or deemed to be established in the local area under the Central Provinces Cotton Market Act, 1932, or the same Act as applied to Berar

Provided that, if there is no such cotton market established in the local area, the said two representatives shall be selected by the District Council from amongst the cotton growers of the local area

(5) The two representatives referred to in clause (b) of sub section (3) shall be elected by the owners of cotton ginning and cotton pressing factories in the local area from amongst themselves

(6) If the representatives of cotton growers or of owners of cotton ginning and cotton pressing factories in any local area referred to in clauses (a) and (b) of sub section (3), are not elected or selected, as the case may be, within such time as may be prescribed, the Deputy Commissioner shall nominate such representatives from amongst the cotton growers or the owners of cotton ginning and cotton pressing factories, as the case may be, from that local area

(7) The Provincial Government may make rules providing for and regulating the election and selection of the representatives referred to in clauses (a) and (b) of sub section (3), the manner of election and selection, the term of office and of the members of the committee, the preparation of voters' lists, where necessary, the filling of any casual vacancies and all matters connected with such election and selection

(8) The Provincial Government may make rules laying down the principles to be observed and the procedure to be followed by the committee in fixing the maxima rates for each season and the rates so fixed by the committee shall be duly made known by the Deputy Commissioner to all concerned in the local area before the commencement of the season in such manner as may be prescribed in the said rules

(9) The provisions of section 13 shall apply to the making of rules under sub sections (6), (7) and (8)

(10) Whoever contravenes the provisions of sub section (2) shall be punishable with fine which may extend to five hundred rupees

(11) While this section is in operation the figure and letter "2 B" shall be deemed to be inserted after the words "for the purposes of sections" in sub section (1) of section 7.

APPENDIX X.

Central Provinces and Berar Cotton Ginning and Pressing
Rates Fixing Rules.

COMMERCE AND INDUSTRY DEPARTMENT.

Nagpur, the 4th July 1940.

No. 2072-2870-VII of 1939.—In exercise of the powers conferred by sub-sections (6), (7) and (8) of section 2-B of the Cotton Ginning and Pressing Factories Act, 1925 (XII of 1925), as inserted by the Central Provinces and Berar Cotton Ginning and Pressing Factories (Amendment) Act, 1939 (XXXIII of 1939), and of the same Act as applied to Berar, the Provincial Government is pleased to make the following rules, the same having been published as required by sub-section (2) of section 13 of the said Act :—

RULES.

1. (a) These rules may be cited as the Central Provinces and Berar Cotton Ginning and Pressing Rates Fixing Rules.

(b) They shall come into force on 1940.

2. In these rules—

(a) " Act " means the Cotton Ginning and Pressing Factories Act, 1925.

(b) " Section " means a section of the Act.

(c) " Season " means the period commencing on the 1st day of September in each year and terminating on the 30th day of June of the year following.

(d) " Form " means a form appended to these rules.

3. (i) As soon as an area is notified under sub-section (2) of section 2-B, the Deputy Commissioner of the district shall arrange for the election of the representatives of cotton growers and/or of owners of cotton ginning and pressing factories in the manner herein-after prescribed.

(ii) The representatives of cotton growers or of owners of cotton ginning and pressing factories in any local area notified under sub-section (2) of section 2-B shall be elected or selected, as the case may be, on or before the 1st June following the date of the notification.

4. (i) The election of the representatives of cotton growers shall be made by inviting nomination papers in Form A and thereafter by means of polling and the manner prescribed for the election of representatives of cotton growers for the constitution of market committees for the management of any cotton markets established or deemed to be established under the Central Provinces Cotton Markets Act, 1932, or the same Act as applied to Berar as the case may be, if such cotton market or markets are established in the local area.

(ii) If there are more cotton markets than one established in the local area, the voters' list for the election of representatives of cotton growers shall consist of the voters'

lists for the election of representatives of cotton growers for the constitution of market committees for all such markets

5 The election of representatives of the owners of cotton ginning and pressing factories shall be made by obtaining nominations and voting papers by post. The Deputy Commissioner shall cause to be prepared copies of the list of owners of ginning and pressing factories in the local area subject to the Factories Act 1934 and send a copy thereof to each owner with a request to send in nominations in Form B by a fixed date. He shall thereafter issue voting papers in Form C by post to each owner who shall mark it in accordance with instructions thereon and return the same to the Deputy Commissioner on or before the date fixed by him. The scrutiny and counting of votes shall be done by an officer not below the rank of an Extra Assistant Commissioner. The two candidates who secure the highest number of votes shall be declared elected. In the event of two or more candidates securing an equal number of votes the election shall be made by lots to be drawn by the officer who does the scrutiny and counting of votes.

6 (1) The term of office of the members of the rate fixing committee shall be three years from the date of their election. Casual vacancies amongst elected or selected members of the committee caused by the death or resignation of a member or by his becoming ineligible for office shall be filled in the same manner in which the original election or selection was held. A member elected or selected to fill a casual vacancy shall hold office during the remaining term of the other members.

(2) The term of office of the nominated members shall be the same as that of representatives in whose place they were nominated.

7 (a) The Deputy Commissioner shall make necessary arrangements for convening meetings of the rate fixing committee.

(b) At least a week's notice of a meeting shall be given to the members, but failure of service of a notice on any member due to wrong address or his absence from his residing place shall not invalidate the proceedings of the committee.

(c) Four members of the committee shall form a quorum provided that at least one representative of cotton growers and one of the owners of cotton ginning and pressing factories are present. No quorum shall be necessary for a meeting which was once adjourned for want of quorum but shall be necessary to give notice of three days even for an adjourned meeting.

(d) All questions shall be decided by a majority of votes of the members present, and in the case of equality of votes the chairman will have a casting vote.

(e) The proceedings of the committee shall be recorded under the signature of the chairman in a register which shall be open for inspection by any member of the committee or owner of a cotton ginning and pressing factory in the local area.

8 In fixing the maximum rates for ginning and/or pressing of cotton the rate fixing committee shall take into consideration the following among other factors —

- (a) amount of cotton to be ginned,
- (b) ginning outturn,

FORM A

Form of Nomination Paper [rule 4(s)]

(1) *B* This nomination paper will not be valid unless it is sent in to the Deputy Commissioner, or other person authorized to receive it at his office between 11 a.m. and 3 p.m. on or before 10)

Name of the local area for which the candidate is nominated

Name of candidate .

Father's name

Age

Address

Number of the candidate in the list of cotton growers in the local area

Name of proposer

Number of proposer in the list of cotton growers in the local area

Signature of proposer

Name of the seconder

Number of the seconder in the list of cotton growers in the local area

Signature of the seconder

Declaration of Candidate

I hereby declare that I agree to this nomination.

Date

19

Signature of Candidate

FORM B.

Form of Nomination Paper (rule 5).

(N.B.—This nomination paper will not be valid unless it is sent in to the Deputy Commissioner, or other person authorized to receive it, at his office, between 11 a.m. and 3 p.m., on or before 19).

Name of the local area for which the candidate is nominated

Name of candidate

Father's name

Age

Number of the candidate in the list of owners of ginning and pressing factories in the local area

Name of proposer

Number of proposer in the list of owners of ginning and pressing factories in the local area

Signature of proposer

Name of the seconder

Number of the seconder in the list of owners of ginning and pressing factories in the local area

Signature of the seconder

Declaration of the Candidate.

I hereby declare that I agree to this nomination.

Date

1940.

Signature of Candidate

FORM C

Form of Voting Paper (rule 5)
(Front of Form)

(Local area and district)	(Local area and district)	
Number of elector in the list of owners mining and pressing factories in the area	Names of candidates	Cross
1		<input data-bbox="745 435 839 538" type="radio"/>
2		<input data-bbox="761 546 854 649" type="radio"/>
3		<input data-bbox="777 657 870 760" type="radio"/>

(Back of Form)

No	No
	<p data-bbox="626 973 761 1016"><i>Instructions</i></p> <p data-bbox="466 1016 771 1093">1 You have only one vote</p> <p data-bbox="471 1033 968 1178">2 Put a X in the circle opposite the name of the candidate for whom you wish to vote</p> <p data-bbox="481 1118 984 1272">3 The words ' Voting Paper ' should be written on the top of the envelope containing a voting paper</p>

By order of the Governor,

Central Provinces and Berar,

C C DESAI,

Secretary to Govt, C P & Berar,

COMMERCE AND INDUSTRY DEPARTMENT

APPENDIX XI.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE
INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON
AUGUST 31st, 1940.*Administration (Central).*

1. SecretaryMr. D. N. Mahta, B.A., (Oxon).
2. Assistant SecretaryMr. C. J. Bocarro, M.B.E., M.A.
3. SuperintendentMr. Ajodhya Sahai.
4. Assistant SuperintendentMr. A. B. Joshi, M.A., B. Com.
5. Statistical AssistantMr. M. S. Natesan, M.A.
6. Technical AssistantMr. K. Dharma Rajulu, M.Sc.
7. AccountantMr. G. D. Kharod.
8. First AssistantMr. V. F. X. Pais.
9. Head Typist and Stenographer ..Mr. P. A. A. Durai.

TECHNOLOGICAL LABORATORY, BOMBAY.

10. DirectorDr. Nazir Ahmad, O.B.E., M.Sc., Ph.D.
(Cantab), F. Inst. P.
11. Senior Research Assistant (Chemist) Mr. D. L. Sen, M.Sc. (Tech.) (Manch.), M.Sc.,
(Bom.), A.I.I.Sc., F.I.C.
12. Senior Research Assistant (Physicist) Mr. N. Hari Rao, M.Sc. (Calcutta).
13. Senior Research Assistant (Physicist) Mr. Ram Saran Koshal, M.Sc. (Punjab).
14. Spinning MasterMr. V. V. Gupte, B.Sc. (Tech.) (Manch.),
B.Sc. (Bom.).
15. Junior Research Assistant (Microscopist)Mr. Amar Nath Gulati, M.Sc. (Punjab).
16. Statistician and Personal Assistant. Mr. V. Venkataraman, M.A. (Madras).
17. Junior Research Assistant (Physicist) Mr. C. Nanjundayya, M.Sc. (Calcutta).
18. Junior Research Assistant (Physicist) Mr. Srinagabhushana, B.Sc. (Mysore).
19. Temporary ChemistDr. L. Thoria, Dr. Ing.
20. Head TesterMr. H. B. Joshi, B.Sc.
21. Senior TesterMr. S. S. Sukthanker, L.T.C. (V.J.T.I.).
22. Junior TesterMr. G. D. Bhide, B.Sc.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE
INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON
AUGUST 31st, 1940—*contd.*

TECHNOLOGICAL LABORATORY, BOMBAY—(*contd.*)

23. Junior Tester .. ..	..	..	..	Mr. K. V. N. Nayyar.
24. Junior Tester .. ..	..	..	..	Mr. V. N. Modak, B.Sc.
25. Junior Tester .. ..	..	..	..	Mr. L. V. Sundararaman, B.A.
26. Junior Tester .. ..	..	..	..	Mr. P. S. Sambamurthy.
27. Junior Tester .. ..	..	..	..	Mr. R. G. Panvalkar, B.Sc.
28. Junior Tester .. ..	..	..	..	Mr. G. J. Kharkar, B.Sc.
29. Junior Tester .. ..	..	..	..	Mr. A. J. Farid.
30. Junior Tester .. ..	..	..	..	Mr. P. V. Nachane, B.Sc.
31. Junior Tester .. ..	..	..	..	Mr. C. S. Ramanathan, B.Sc.
32. Junior Tester .. ..	..	..	..	Mr. B. N. Probhakar, M.Sc.
33. Junior Tester .. ..	..	..	..	Mr. K. S. Marat, B.A.; LL.B.
34. Junior Tester .. ..	..	..	..	Mr. S. B. Mogre, M.Sc.
35. Junior Tester .. ..	..	..	..	Mr. P. D. Vakil.
36. Statistical Clerk .. ..	..	..	..	Mr. R. Krishna Iyer.
37. Statistical Clerk .. ..	..	..	..	Mr. P. K. Wagle.
38. Electrician .. ..	..	..	..	Mr. H. Lobo, L.E.E. (V.J.T.I.).
39. Spinning Assistant .. ..	..	..	..	Mr. N. Iyengar.
40. Draughtsman .. ..	..	..	..	Mr. B. G. Mehta.
41. Mechanic .. ..	..	..	..	Mr. J. B. Khatas.
42. Junior Tester (Offg.) .. ..	..	..	..	Mr. C. A. S. Iyer, B.Sc.
43. Junior Tester (Offg.) .. ..	..	..	..	Mr. M. Bhasker Rao.
44. Junior Tester (Temporary) .. ..	..	..	..	Mr. R. B. Joshi.
45. Junior Tester (Temporary) .. ..	..	..	..	Mr. S. Ramanathan.

INSTITUTE OF PLANT INDUSTRY, INDORE.

46. Director .. ..	..	..	..	Mr. T. R. Low, B.Sc. (Agri.) (London), I.A.S.
47. Personal Assistant .. ..	..	..	..	Mr. A. N. Silvastava, M.Sc. (Lucknow).
48. Agricultural Chemist .. ..	..	..	..	Dr. A. Sreenivasan, M.A., D.Sc. (Madras), A.I.C.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE
INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON
AUGUST 31st, 1940—*contd.*

INSTITUTE OF PLANT INDUSTRY, INDORE—(*contd.*)

49. Extension Officer Mr. Kuber Singh, B.Ag. (Bombay).
50. Farm Superintendent and part-time Extension Officer .. Mr. S. C. Talesara, B.Ag. (Bombay).
51. Plant Breeder Mr. C. P. Dutt, M.Sc. (Calif).
52. Plant Breeding Assistant .. Mr. K. M. Simlote, B.Ag. (Nagpur).
53. Assistant Farm Superintendent and Seed Multiplication Officer .. Mr. L. N. Desai, B.Sc. (Agra).
54. Librarian Mr. B. H. Khan.
55. Artist Mr. J. S. Onkar.

COTTON GENETICS RESEARCH SCHEME, INDORE.

56. Geneticist and Botanist .. Mr. K. Ramiah, M.B.E., M.Sc., Dip. Agri. (Cantab.), L.Ag.
57. Statistician Dr. V. G. Panse, B.Sc. (Bom.), Ph.D. (Lond.).
58. Senior Botanical Assistant .. Mr. P. D. Gadkari, M.Sc. (Nagpur).
59. Genetical Assistant Mr. Bholanath, M.Sc. (Punjab).
60. 2nd Botanical Assistant .. Mr. D. Ganesan, B.A., M.Sc. (Madras).

BOMBAY.

(i) *Broach Cotton Breeding Scheme.*

61. Cotton Breeder Mr. P. L. Patel, M.Sc. (Agri.), (Iowa, U.S.A.).
62. Botanical Assistant Mr. S. J. Patel, M.Ag. (Bombay).
63. Botanical Assistant Mr. D. D. Gopani, B.Sc. (Agri.)

(ii) *Jalgaon Cotton Breeding Scheme.*

64. Agricultural Overseer Mr. S. N. Deshpande, B.Sc. (Agri.) (Bombay).

(iii) *Scheme for Interspecific Hybridisation in Cottons at Surat.*

65. Agricultural Overseer Mr. K. C. Amin, B.Ag.
66. Agricultural Overseer and Botanical Assistant Mr. S. M. Patel, B.Ag.

(iv) *Poona Cotton Wilt Breeding Scheme.*

67. Pathological Assistant Mr. J. D. Ranadive, B.Ag. (Bombay).
68. Pathological Assistant Mr. Y. S. Kulkarni, B.Ag. (Bombay).

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE
INDIAN CENTRAL COTTON COMMITTEE FUNDS AS ON
AUGUST 31st, 1919—*contd.*

(i) Scheme for Breeding of Weevil Resistant Cotton in Surat Area

69 Agricultural Overseer Mr B P Shah, B Ag (Bombay),

(vi) Scheme for Improvement of Wajal Cotton at Pilemangam

70 Agricultural Overseer Mr R T Nalk B Ag (Bombay)

(vii) Scheme for Inclusion of Northern and Western in
Dry Farming Scheme at Pilemangam

71 Agricultural Overseer Mr B M Hannayodhinath, B Sc. (Agl.)

(viii) Surat Feed Distribution Scheme

72 Cotton Assistant Mr V V Patel, B Ag (Bombay)

(ix) Khandesh (Jalgaon) Feed Distribution Scheme

73 Superintendent, Bhailgaon Farm .. Mr D B Parve, B Ag.

74 Cotton Superintendent, Jalgaon .. Mr K B Mehta, B Ag.

75 Agricultural Overseer, Jalgaon .. Mr P V Desai, B Ag.

76 Agricultural Overseer, Jalgaon .. Mr P P Desai, B Ag. (Agl.)

77 Agricultural Overseer, Jalgaon .. Mr M V. Pandey, B Sc. (Agl.)

(x) B D A Feed Distribution Scheme

78 Cotton Superintendent, B D A .. Mr L S. Desai, B Ag. (Bombay)

79 Agricultural Overseer Mr D A. Desai, B Ag. (Bombay).

(xi) Jaywant and Gadhing Feed Distribution Scheme.

80 Cotton Overseer, Dattaraj Mr. P. T. Desai, B Ag.

81 Cotton Overseer, Bhatnagar Mr. J. L. Bhatnagar, B Sc. (Agl.)

82 Cotton Overseer, Bhatnagar Mr. P. T. Desai, B Ag.

83 Cotton Overseer, Bhatnagar Mr. P. T. Desai, B Ag.

84 Cotton Overseer, Gadhing Mr. B. P. Patel, B Ag.

85 Technical Assistant, Dattaraj, Mr. H. K. Desai, B Sc. (Agl.)

86 Technical Assistant, Dattaraj, Mr. V. P. Desai, B Sc. (Agl.)

87 Cotton Overseer, Dattaraj, Mr. P. T. Desai, B Ag.

88 Cotton Overseer, Dattaraj, Mr. P. T. Desai, B Ag.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE
INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON
AUGUST 31st, 1940—*contd.*

(ii) *Sind Seed Distribution Scheme.*

88.	Senior Cotton Superintendent	..	Mr. H. A. Idnani, B.Ag. (Bombay).
89.	Second Cotton Superintendent	..	Mr. W. P. Shahani, B.Ag. (Bombay).
90.	Senior Assistant	.. ..	Mr. R. M. Ranji, Dip. Agri. (Bombay).
91.	Junior Assistant	.. ..	Mr. S. M. Khalsa, B.Ag. (Bombay).
92.	Junior Assistant	.. ..	Mr. Md. Amin Bhatti, B.Ag. (Bombay).
93.	Junior Assistant	.. ..	Mr. Sampuransing Kahan, B.Ag. (Bombay).
94.	Junior Assistant	.. ..	Mr. Lekhraj Parmanand.
95.	Junior Assistant	.. ..	Mr. K. G. Rajpur, B.Ag. (Bombay).
96.	Junior Assistant	.. ..	Mr. H. N. Bolina, B.Ag. (Bombay).
97.	Junior Assistant	.. ..	Mr. K. K. Advani, B.Ag. (Bombay).
98.	Junior Assistant	.. ..	Mr. N. S. Khemchandani, B.Ag. (Bombay).
99.	Junior Assistant	.. ..	Mr. G. H. W. Abbasi, B.Ag. (Bombay).
100.	Junior Assistant	.. ..	Mr. G. M. Advani.
101.	Junior Assistant	.. ..	Mr. Khemchand H. Sujansingani, B.Sc., Post Graduate training.

(iii) *Scheme for Investigation into Black Headed Cricket in Sind.*

102.	Assistant Entomologist	.. ..	Mr. Gobind Ram, M.Sc. (Hons.) (Punjab).
103.	Field Assistant	.. ..	Mr. Shanti Sarup.

(iv) *Scheme for Production of Long Staple Cottons in Sind.*

104.	Cotton Botanist	.. ..	Dr. R. Sankaran, M.A. (Madras), Ph. D. (London), D.I.C.
105.	Senior Assistant	.. ..	Mr. T. J. Chellaramani, B.Ag. (Bombay).
106.	Junior Assistant	.. ..	Mr. A. D. Hiranandani, B.Sc. (Agri.) (Texas, U.S.A.).
107.	Junior Assistant	.. ..	Mr. D. H. Bhavnani, B.Sc. (Agri.) (Bombay), M.Sc. (Agri.) (Texas, U.S.A.).

108 Technological Assistant, (Sakrand) .. Mr. S. M. Navaz, B.Sc.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE
INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON
AUGUST 31st, 1940—contd.

CENTRAL PROVINCES AND BERAR

(i) Central Provinces and Berar Cotton Board of Science.

109	Economic Botanist for Cotton	..	..	..	Mr S. S. Pandey, M.Sc.
110	Research Officer	..	..	..	Mr. S. C. Roy, L.Ag. and Post Graduate, Pusa,
111	Research Officer	..	..	..	Mr D. L. Jaiswal, L.Ag (Hons.)
112	Junior Research Assistant				Mr D. Y. Bhand, L.Ag (Hons.)
113	Junior Research Assistant				S. L. Nema, B.Ag.
114	Junior Research Assistant	..			Mr N. P. Deshmukh, B. Ag.

(ii) Scheme for Extension and Marketing of V. 434 Cotton

115	Agricultural Assistant	..			Mr. G. O. Tiwari, Certificate Course of Agricultural College, Nagpur.
116	Agricultural Assistant	..			Mr. L. P. Khare, B. Ag.
117	Agricultural Assistant	..			Mr. G. N. Wankhede, B. Ag.
118	Agricultural Assistant				Mr. M. D. Anandani, B. Ag.
119	Agricultural Assistant	..			Mr. T. N. Purankar, B. Ag.
120	Agricultural Assistant	..			Mr. V. G. Dandekar, B. Ag.
121	Agricultural Assistant	..			Mr. D. R. Heman, B. Ag.

(iii) Scheme for Distribution and Marketing of Hart V. 12 Cotton

122	Agricultural Assistant	..			Mr. K. B. H. Chakrabarti, B. Ag.
123	Agricultural Assistant	..			Mr. T. P. Chakrabarti, B. Ag.

(iv) Scheme for Investigation of Histioglyphus

124	Agricultural Assistant	..			Mr. P. J. Prasad, B. Ag.
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V. 434

(i) Periplaneta fulva

125	Assistant Botanist	Mr. G. P. Singh, B. Ag.
126	Assistant Botanist	Mr. G. P. Singh, B. Ag.
127	Assistant Entomologist	..	..	..	Mr. G. P. Singh, B. Ag.

* Paid by the Government of India.

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE
INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON
AUGUST 31st, 1940—contd.

(ii) *Scheme for Investigation of Cotton Stem Weevil of South India.*

128. ParasitologistMr. P. N. Krishna Ayyar, B.A.

(iii) *Madras Nadam Cotton Breeding Scheme.*

129. AssistantMr. P. N. Krishnaswami Rao, B.Sc. (Ag.).

(iv) *Scheme for Improvement of Mungari Cotton.*

130. AssistantMr. V. K. Subramanya Mudaliar, L.Ag.

(v) *Scheme for Improvement of Cocanadas Cotton.*

131. AssistantR. Balasubrahmanya Ayyar, B.A., B.Sc., (Ag.).

132. Technological Assistant (Coimbatore) Mr. R. L. N. Iyengar, M.Sc.

PUNJAB.

(i) *Punjab Botanical Scheme.*

133. Cotton Research BotanistMr. Mohammad Afzal, *B.Sc. (Agri.) (Punjab),
A.I.C.T.A. (Trinidad).

134. Assistant to Cotton Research
BotanistChaudhri Mohammad Akbar, L.Ag.

135. Extra Assistant Director of Agriculture (Cotton)Mr. S. Sarup Singh, L.Ag., M.Sc. (Texas,
U.S.A.).

136. Agricultural AssistantS. Fateh Ali Shah, B.Sc. (Agri.).

137. Agricultural AssistantBh. Bantasingh, B.Sc. (Agri.).

138. Agricultural AssistantBh. Autar Singh, B.Sc. (Agri.).

139. Agricultural AssistantBh. Santokh Singh, B.Sc. (Agri.).

140. Agricultural Assistant (A Class)Ch. Mohammad Rashid Khan, L.C. (Course),
Munshi Fazil, B.A. (Punjab University).

141. Agricultural Assistant (A Class)Mr. Satya Prakash Kohli, B.Sc. (Agri.).

142. Agricultural Assistant (B Class)Mr. S. E. Daniel, L.C. (Course).

143. Agricultural Assistant (B Class)Mr. Sikandar Lal Sehgal, B.Sc. (Agri.).

144. Statistical AssistantMr. L. Dwarka Nath Nanda, M.A., B.Sc.
(Agra).

145. Technological Assistant (Lyallpur)Mr. S. Raja Raman, B.A. (Madras), M.Sc.
(Benares), A. Inst. P. (London).

LIST OF SCIENTIFIC, TECHNICAL AND OTHER OFFICERS PAID FROM THE
INDIAN CENTRAL COTTON COMMITTEE'S FUNDS AS ON
AUGUST 31st, 1940—contd.

(ii) *Scheme for Improvement of Punjab American 289F Cotton*

146 Agricultural Assistant Ch Kanshi Ram, B Sc (Agri)

(iii) *Punjab Root Rot Scheme*

147 Assistant Cotton Mycologist Dr R S Vasudeva B Sc, Ph D (London)
D I C (London)

148 Agricultural Assistant Ch Mohd Ashraf, B Sc (Agri)

149 Agricultural Assistant L Mulk Raj Sikka B Sc (Agri)

(iv) *Punjab Physiological (Cotton Failure Research) Scheme*

150 Plant Physiologist Prof R H Dastur, M Sc, F L S

151 Bio Chemist Dr A M Samant M Sc Ph D

152 Research Assistant Dr J J Chinnoy M Sc (Bombay) Ph D
(London) D I C

153 Agricultural Assistant .. Mr Abdul Ahad M Sc (Agri)

Agricultural Assistant .. Bh Suresh Singh, B Sc (Agri)

Agricultural Assistant .. Bh Mukhtar Singh B Sc (Agri)

Agricultural Assistant .. Mr Harmandar Lal Uppal, M Sc (Hons)

Agricultural Assistant .. Bh. Amrik Singh, B Sc (Agri)

(v) *Scheme for Cotton Jassid Investigation*

Agricultural Assistant .. Mr Manzur Abbas, B.Sc (Agri).

UNITED PROVINCES

United Provinces Botanical Scheme

Botanical Assistant .. Mr B M Dabral, M Sc.

Botanical Assistant .. Mr R M Arora, M Sc.

Technical Assistant .. Mr G K Sant, B Sc

Biological Assistant (Cawnpore) Mr S Samson, B Sc.

BENGAL

Comilla Cotton Scheme

Research Officer .. Mr. V. N. Paranjpe, B Sc (Allahabad)